## **Contents**

Forewordxı
About the Authorxvii
About the Technical Reviewerxix
Acknowledgmentsxx
Introduction and AFAQ (Anticipated Frequently Asked Questions)xxiii
Who Is This Book For?xix
What Do I Need to Run the Examples?xx
Why Isn't There Any Real-World Code?xx
How Come You Don't Have Tables Listing All the Options/Methods/Parameters of Each Tool/Class/Method?xx
Why Do I Keep Getting "File Not Found" Exceptions  When I Run the Example Code?xxx
What's Up with the Spinal Tap Quotes?xx
Chapter 1 The Evolution of Distributed Programming1
Overview of Distributed Programming
A Short History of Distributed Programming
The Web Architecture

Microsoft and Distributed Computing	18
The Era of PC Dominance	19
The Age of Enlightenment	19
The Days of Disillusionment	21
The Present: .NET	23
Summary	24
Chapter 2 This Is .NET	27
Understanding the .NET Infrastructure	27
The Importance of Type	
The Three Cs of .NET: CTS, CLS, and CLR	28
Using Namespaces	
Assemblies and Manifests	
Intermediate Language	32
Building and Configuring .NET Assemblies	33
Building a Private Assembly	
Building a Shared Assembly	44
Understanding .NET Versioning	54
Setting an Assembly's Version Information	
Revisiting the Application Configuration File	
Setting Machine-wide Version Policies	
Using the .NET Framework Configuration Tool	
Configuring Publisher Policy	
Policy Precedence	
Using the <codebase> Element</codebase>	
Viewing the Assembly Binding Log	
Summary of the Binding Process	68
Understanding Attributes and Reflection	68
Using CLR Attributes	
Implementing Custom Attributes	
Reflecting upon Reflection	
Attributes and Reflection in Perspective	
Understanding Garbage Collection	
Reference Counting vs. Garbage Collection	
Garbage Collection Internals	
Implementing the Finalize Method	
Implementing the IDisposable Interface	
Garbage Collection in Perspective	

Serialization	84
Using the Serializable Attribute	85
ISerializable and Formatters	
Summary	89
Chapter 2 Introduction to NET Demoting	
Chapter 3 Introduction to .NET Remoting	91
What Is Remoting?	91
Understanding Application Domains	92
Programming with Application Domains	93
Understanding Context	
Marshaling Objects	105
Marshal By Value Objects	
Marshal By Reference Objects	
Static Methods and Other Remoting Details	
Summarizing Marshaling and Context Agility	
Examining the .NET Remoting Framework	
Looking at the Big Picture	
Well-Known vs. Client-Activated Objects	
Understanding Proxies	
Understanding Channels and Formatters	114
Summary	117
54mm02y	
Chapter 4 Distributed Programming	
,	
with .NET Remoting	119
Implementing Well-Known Objects	110
Building the Server	
Building the Client	
Singleton Mode vs. SingleCall Mode	
Looking (Briefly) at Some Remoting Issues	
Remoting Configuration	
Implementing Client-Activated Objects	
Building the Server	
9	
Building the Client	
Understanding Lease-based Lifetimes	
Building Remoting Hosts	
Hosting Remotable Objects in a Windows Service	
Hosting Remotable Objects in ASP.NET	167
Summary	172

Chapter 5 Additional Remoting Technique	<b>'S</b> 175
Solving the Metadata Deployment Issue  Deploying Metadata Assemblies  Deploying Interface Assemblies  Using the Soapsuds Utility  Summary of Deployment Issues	176 186 193
Understanding Delegates	201 206 214
Understanding Call Context  Call Context vs. Thread Local Storage  Using Call Context with Remoting  Using Call Context with Asynchronous Calls  Using Call Context Headers	229 230 233
Summary	236
Chapter 6 Understanding XML Web Service	<b>'S</b> 237
Web Services Overview Why Web Services? Web Service Composition The World Wide Web Consortium	238 239
Building and Consuming Web Services in .NET  The IIS to ASP.NET to Web Service Relationship  Using Code-Behind  Building Web Services with Visual Studio .NET  Consuming the Web Service  Calling Web Services Asynchronously  Returning Custom Types from the Web Service  Using the ASP.NET Session Object	
Remoting vs. Web Services	270
Summary	271

Chapter 7 Understanding COM Interop	273
The Need for COM Interop	273
Managed to Unmanaged Interop	274
Understanding the Runtime Callable Wrapper	
Building an Interop Assembly	
Unmanaged to Managed Interop	
Understanding the COM Callable Wrapper	
Registering an Assembly for COM Interop	
Writing Managed Code for COM Interop	
-	
Summary	288
Chapter 8 Leveraging Component Services	289
Component Services Overview	289
Component Services Motivation	
Revisiting Context	
Survey of Component Services	
Survey of COM+ Configuration Settings	292
Building Serviced Components in Managed Code	295
Populating the COM+ Catalog	
Experimenting with a Simple Serviced Component	299
Examining COM+ and .NET Interaction	317
Just-In-Time Activation	319
Understanding Object Pooling	329
Using Object Construction	334
Automatic Transactions	335
The Distributed Transaction Coordinator	
Enabling Transactions	
Determining the Transaction's Outcome	
Consuming Serviced Components	
Exposing Objects with DCOM Exposing Objects with .NET Remoting	
Investigating New Features in COM+ 1.5	
Application Recycling and Pooling	
Configurable Transaction Isolation Levels	
SOAP Services	354
Summary	355

Chapter 9 .NET Message Queuing	357
Message Queuing Overview	357
Why Message Queuing?	
Message Queuing Architecture	
Message Queuing vs. Remoting vs. Web Services	
Installing and Administering MSMQ	360
MSMQ Installation Options	360
Creating and Managing Queues	363
Using .NET Message Queuing	365
Building the Sender	365
Building the Receiver	370
Sending Custom Types in Messages	376
Writing Queued Components in Managed Code	384
The Queued Component Architecture	385
Implementing a Queued Component	
Handling Queued Component Exceptions	388
Summary	391
Appendix Data Access with ADO.NET	395
The Need for ADO.NET	395
ADO.NET: The Big Picture	
Understanding ADO.NET Namespaces	397
The Types of System.Data	
Examining the DataColumn Type	
Building a DataColumn	
Adding a DataColumn to a DataTable	
Configuring a DataColumn to Function as a Primary Key	
Enabling Autoincrementing Fields	
Configuring a Column's XML Representation	406
Examining the DataRow Type	407
Understanding the DataRow.RowState Property	407
The ItemArray Property	
Details of the DataTable	411

Building a Complete DataTable	413
Manipulating a DataTable: Deleting Rows	416
Manipulating a DataTable: Applying Filters and Sort Orders	417
Manipulating a DataTable: Updating Rows	420
Understanding the DataView Type	422
Understanding the Role of the DataSet	
Members of the DataSet	427
Building an In-Memory DataSet	427
Expressing Relations Using the DataRelation Type	432
Navigating Between Related Tables	433
Reading and Writing XML-Based DataSets	437
Building a Simple Test Database	438
ADO.NET Managed Providers	440
Working with the OleDb Managed Provider	441
Establishing a Connection Using the OleDbConnection Type	
Building a SQL Command	444
Working with the OleDbDataReader	
Connecting to an Access Database	
Executing a Stored Procedure	448
The Role of the OleDbDataAdapter Type	451
Filling a DataSet Using the OleDbDataAdapter Type	452
Working with the SQL Managed Provider	455
The System.Data.SqlTypes Namespace	456
Inserting New Records Using the SqlDataAdapter	456
Updating Existing Records Using the SqlDataAdapter	459
Autogenerated SQL Commands	461
Filling a Multitabled DataSet (and Adding DataRelations)	464
Summary	467
Index	<i>16</i> 0