

Accelerated VB 2008



Guy Fouché and Trey Nash

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—Guy Fouché*

Contents at a Glance

About the Authors	xi
About the Technical Reviewers	xiii
Acknowledgments	xv
Introduction	xvii
■ CHAPTER 1 VB 2008 Overview	1
■ CHAPTER 2 VB 2008 Syntax	11
■ CHAPTER 3 Classes and Structures	35
■ CHAPTER 4 Methods, Properties, and Fields	69
■ CHAPTER 5 VB 2008 and the CLR	85
■ CHAPTER 6 Interfaces	97
■ CHAPTER 7 Operator Overloading	117
■ CHAPTER 8 Exception Handling	133
■ CHAPTER 9 Working with Strings	167
■ CHAPTER 10 Arrays and Collections	197
■ CHAPTER 11 Delegates and Events	217
■ CHAPTER 12 Generics	237
■ CHAPTER 13 Threading	271
■ CHAPTER 14 VB 2008 Best Practices	317
■ CHAPTER 15 LINQ with VB 2008	373
■ APPENDIX A Resources	417
■ APPENDIX B Running the Examples	421
■ INDEX	423

Contents

About the Authors	xi
About the Technical Reviewers	xiii
Acknowledgments	xv
Introduction	xvii
■ CHAPTER 1	VB 2008 Overview
	1
	Differences Between VB 2008, C# 3.0, and VB6
	1
	CLR Garbage Collection
	3
	Common Type System
	3
	A Simple VB 2008 Program
	5
	What's New in VB 2008
	5
	Summary
	10
■ CHAPTER 2	VB 2008 Syntax
	11
	Types and Variables
	11
	Namespaces
	25
	Statements
	29
	Control Flow Constructs
	29
	Iteration and Looping Constructs
	31
	Summary
	33
■ CHAPTER 3	Classes and Structures
	35
	Class Definitions
	35
	Value Type Definitions
	48
	Boxing and Unboxing
	52
	System.Object
	57
	Creating Objects
	58
	Destroying Objects
	62
	Disposable Objects
	63
	Summary
	67

CHAPTER 4	Methods, Properties, and Fields	69
	Methods	69
	Properties	77
	Fields	80
	Summary	84
CHAPTER 5	VB 2008 and the CLR	85
	From VB to IL	85
	From IL to Platform	87
	Understanding Assemblies	88
	Metadata	95
	Summary	96
CHAPTER 6	Interfaces	97
	Interfaces Are Reference Types	97
	Defining Interfaces	98
	Implementing Interfaces in Structures	103
	Using Generics with Interfaces	105
	Contracts	107
	Choosing Between Interfaces and Classes	110
	Polymorphism with Interfaces	114
	Summary	115
CHAPTER 7	Operator Overloading	117
	Just Because You Can Doesn't Mean You Should	117
	Operators That Can Be Overloaded	117
	Types and Formats of Overloaded Operators	118
	Operators Shouldn't Mutate Their Operands	119
	Does Parameter Order Matter?	120
	Overloading the Addition Operator	121
	Comparison Operators	122
	Conversion Operators	129
	Summary	132
CHAPTER 8	Exception Handling	133
	Handling Exceptions	133
	Avoid Using Exceptions to Control Flow	134

	Mechanics of Handling Exceptions in VB 2008	134
	Achieving Exception Neutrality	143
	Creating Custom Exception Classes	155
	Working with Allocated Resources and Exceptions	158
	Providing Rollback Behavior	162
	Summary	165
■ CHAPTER 9	Working with Strings	167
	String Overview	167
	String Literals	168
	Format Specifiers and Globalization	169
	Working with Strings from Outside Sources	181
	StringBuilder	184
	Searching Strings with Regular Expressions	185
	Summary	196
■ CHAPTER 10	Arrays and Collections	197
	Introduction to Arrays	197
	Multidimensional Arrays	200
	Multidimensional Jagged Arrays	202
	Collection Types	203
	How Iteration Works	211
	Summary	215
■ CHAPTER 11	Delegates and Events	217
	Overview of Delegates	217
	Delegate Creation and Use	218
	Events	229
	Summary	235
■ CHAPTER 12	Generics	237
	Introduction to Generics	237
	Generic Type Definitions and Constructed Types	240
	Constraints	251
	Generic System Collections	255
	Select Problems and Solutions	257
	Summary	270

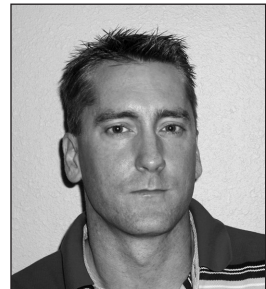
■ CHAPTER 13	Threading	271
	Threading in VB 2008 and .NET 3.5	271
	Synchronizing Threads	285
	Using the Thread Pool	309
	Summary	316
■ CHAPTER 14	VB 2008 Best Practices	317
	Reference-Type Best Practices	317
	Value-Type Best Practices	362
	Summary	372
■ CHAPTER 15	LINQ with VB 2008	373
	LINQ Overview	373
	LINQ to Objects	379
	LINQ to XML	389
	LINQ to SQL	405
	Summary	416
■ APPENDIX A	Resources	417
	Books	417
	Articles	418
	Web	418
■ APPENDIX B	Running the Examples	421
	Example Types	421
	A Few Words Regarding Modules	422
■ INDEX	423

About the Authors

■ **GUY FOUCHÉ** is a business intelligence and decision support system consultant in the Dallas, Texas, area. He has developed a large number of Visual Basic systems in a variety of industries, supporting companies of all shapes and sizes. His VB programming experience dates back to Version 1. Yes, Version 1. Guy spends his evenings playing one of his eight trumpets and expanding his composition skills using the current generation of music technologies. On the weekend, he puts as many miles as he can on his bright yellow Honda F4i sport motorcycle. Guy and Jodi enjoy taking nine-day trips in their Jeep 4 × 4, taking photographs and writing travelogues along the way. You can view their photography at <http://photography.fouche.ws>.



■ **TREY NASH** is a principal software engineer working on security solutions at a market-leading security software company. Prior to that, he developed Bluetooth solutions for the release of Microsoft Vista, and he called Macromedia Inc. home for five years before that. At Macromedia, he worked on a cross-product engineering team for several years, designing solutions for a wide range of products throughout the company, including Flash and Fireworks. He specialized in COM/DCOM using C/C++/ATL until the .NET revolution. He's been glued to computers ever since he scored his first, a TI-99/4A, when he was a mere 13 years old. He astounded his parents by turning a childhood obsession into a decently paying career, much to their dismay. Trey received his bachelor of science and his master of engineering degrees in electrical engineering from Texas A&M University. When he's not sitting in front of a computer, you can find him working in his garage, playing his piano, brushing up on a foreign language (Russian and Icelandic are the current favorites), or playing ice hockey.



About the Technical Reviewers

■ **TIM PATRICK** has been working professionally as a software architect and developer for nearly 25 years. By day he develops custom business applications in Visual Basic for small to medium-sized organizations. He is a Microsoft Certified Solution Developer (MCSD). In April 2007, Microsoft awarded Tim with its Most Valuable Professional (MVP) award for his work in supporting and promoting Visual Basic and its community of users. Tim received his undergraduate degree in computer science from Seattle Pacific University. You can contact him through his web site, www.timaki.com.

■ **FABIO CLAUDIO FERRACCHIATI** is a senior developer for Brain Force (www.brainforce.com). A prolific writer on leading-edge technologies, he's contributed to more than a dozen books on .NET, C#, Visual Basic, and ASP.NET. He's a .NET MCSD and lives in Milan, Italy.

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Introduction

Visual Basic 2008 (VB 2008) is relatively easy to learn for anyone familiar with another object-oriented language. Even someone familiar with Visual Basic 6.0 who is looking for an object-oriented language will find VB 2008 easy to pick up. However, though VB 2008, coupled with .NET, provides a quick path for creating simple applications, you still must know a wealth of information and understand how to use it correctly in order to produce sophisticated, robust, fault-tolerant applications. We teach you what you need to know and explain how best to use your knowledge so that you can quickly develop true VB 2008 expertise.

Idioms and design patterns are invaluable for developing and applying expertise, and we show you how to use many of them to create applications that are efficient, robust, fault-tolerant, and exception-safe. Although many are familiar to C++ and Java programmers, some are unique to .NET and the Common Language Runtime (CLR). We show you how to apply these indispensable idioms and design techniques to seamlessly integrate your VB 2008 applications with the .NET runtime, focusing on the new capabilities of VB 2008.

Design patterns document best practices in application design that many different programmers have discovered and rediscovered over time. In fact, .NET itself implements many well-known design patterns. You will see these practices detailed throughout this book. Also, it is important to note that the invaluable tool chest of techniques is evolving constantly.

.NET 3.5 provides a unique and stable cross-platform execution environment. VB 2008 is only one of the languages that target this powerful runtime. You will find that many of the techniques explored in this book are also applicable to any language that targets the .NET runtime.

As you'll see, it doesn't take years of trial-and-error experience to become a VB 2008 expert. You simply need to learn about the right tools and the correct ways to use them. That's why we wrote this book for you.

About This Book

We assume that you already have a working knowledge of some object-oriented programming language, such as C++, Java, or Visual Basic. If you already know some VB 2005 or VB 2008, you may find yourself skimming Chapters 1 and 2.

Chapter 1, "VB 2008 Overview," gives a quick glimpse of what a simple VB 2008 application looks like.

Chapter 2, "VB 2008 Syntax," introduces the VB 2008 language syntax. We introduce you to the two fundamental kinds of types within the CLR: value types and reference types. We also describe namespaces and how you can use them to logically partition types and functionality within your applications.

Chapter 3, "Classes and Structures," provides details about defining types in VB 2008. You'll learn more about value types and reference types in the CLR. We also discuss the inefficiencies inherent in boxing and discuss object creation, initialization, and destruction.

Chapter 4, “Methods, Properties, and Fields,” discusses using methods to add behavior to your types, using properties to enforce encapsulation, and using fields to represent the state of your object. You’ll explore method parameter types, overloading, property modifiers, and field initializers.

Chapter 5, “VB 2008 and the CLR,” expands on Chapter 1 and quickly explores the managed environment within which VB 2008 applications run. We introduce you to assemblies, which are the basic building blocks of applications into which VB 2008 code files are compiled. Additionally, you’ll see how metadata makes assemblies self-describing.

Chapter 6, “Interfaces,” details interfaces and the role they play in the VB 2008 language. Interfaces provide a functionality contract that types may choose to implement. You’ll learn the various ways that a type may implement an interface, as well as how the runtime chooses which methods to call when an interface method is called.

Chapter 7, “Operator Overloading,” details how you may provide custom functionality for the built-in operators of the VB 2008 language when applied to your own defined types. You’ll see how to overload operators responsibly, since not all managed languages that compile code for the CLR are able to use overloaded operators.

Chapter 8, “Exception Handling,” shows you the exception-handling capabilities of the VB 2008 language and the CLR. Creating exception-safe and exception-neutral code is tricky in VB 2008, and you’ll see that creating fault-tolerant, exception-safe code doesn’t require the use of Try, Catch, or Finally constructs at all. We also describe some of the capabilities within the .NET runtime that allow you to create more fault-tolerant code.

Chapter 9, “Working with Strings,” describes how strings are a first-class type in the CLR and how to use them effectively in VB 2008. A large portion of the chapter covers the string-formatting capabilities of various types in the .NET Framework and how to make your defined types behave similarly by implementing *IFormattable*. Additionally, we introduce you to the globalization capabilities of the framework and show you how to create custom *CultureInfo* instances for cultures and regions that the .NET Framework doesn’t already know about.

Chapter 10, “Arrays and Collections,” covers the various array and collection types available in VB 2008. You can create two types of multidimensional arrays, as well as your own collection types, while utilizing collection-utility classes. You’ll also learn how to implement *IEnumerable* so that your collection types will work well with `For . . . Each` statements.

Chapter 11, “Delegates and Events,” shows you the mechanisms used within VB 2008 to provide callbacks. Historically, all viable frameworks have always provided a mechanism to implement callbacks. VB 2008 goes one step further and encapsulates callbacks into callable objects called *delegates*. Also, you’ll see how the .NET Framework builds upon delegates to provide a publish-subscribe event-notification mechanism, allowing your design to decouple the source of the event from the consumer of the event.

Chapter 12, “Generics,” introduces you to probably the most exciting feature added to VB 2008 and the CLR. Using generics, you can provide a shell of functionality within which to define more specific types at run time. Generics are most useful with collection types and provide great efficiency compared to the collections of previous .NET versions.

Chapter 13, “Threading,” covers the tasks required in creating multithreaded applications in the VB 2008 managed virtual execution environment. You’ll see how delegates, through use of the “I owe you” (IOU) pattern, provide an excellent gateway into the process thread pool. Arguably, synchronization is the most important concept when getting multiple threads to run concurrently. This chapter covers the various synchronization facilities available to your applications.

Chapter 14, “VB 2008 Best Practices,” is a dissertation on the best design practices for defining new types and how to make them so you can use them naturally and so consumers won’t abuse them inadvertently. We touch upon some of these topics in other chapters, but discuss them in detail in this chapter. This chapter concludes with a checklist of items to consider when defining new types using VB 2008.

Chapter 15, “LINQ with VB 2008,” explores a new set of technologies built into the .NET 3.5 Framework. LINQ provides a common object model and syntax to consume data with your VB 2008 applications. This chapter covers LINQ to Objects, LINQ to XML, and LINQ to SQL, showing you how to query in-memory objects, XML documents, and relational databases with these technologies. We also discuss several technologies that support LINQ, including type inference, anonymous types, extension methods, and Lambda expressions.

