

# Accelerated Silverlight 2



Jeff Scanlon

## **Accelerated Silverlight 2**

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*To Corey Chang, for showing me just how much patience can pay off.*



# Contents at a Glance

About the Author .....	xiii
About the Technical Reviewer.....	xv
Acknowledgments .....	xvii
Introduction.....	xix
■ <b>CHAPTER 1</b> Introducing Silverlight .....	1
■ <b>CHAPTER 2</b> Getting to Know XAML .....	13
■ <b>CHAPTER 3</b> Creating User Interfaces .....	37
■ <b>CHAPTER 4</b> Network Communication.....	71
■ <b>CHAPTER 5</b> Working with Data.....	97
■ <b>CHAPTER 6</b> Working with Media .....	117
■ <b>CHAPTER 7</b> Extending the User Interface .....	141
■ <b>CHAPTER 8</b> Styling and Templating.....	163
■ <b>CHAPTER 9</b> Animation .....	183
■ <b>CHAPTER 10</b> Dynamic Languages and the Browser .....	207
■ <b>CHAPTER 11</b> Security .....	229
■ <b>CHAPTER 12</b> Testing and Debugging .....	251
■ <b>CHAPTER 13</b> Packaging and Deploying Silverlight Applications.....	271
■ <b>CHAPTER 14</b> Advanced Topics.....	293
■ <b>CHAPTER 15</b> Case Study: Campus Explorer .....	315
■ <b>INDEX</b> .....	333



# Contents

About the Author .....	xiii
About the Technical Reviewer.....	xv
Acknowledgments .....	xvii
Introduction.....	xix
■ <b>CHAPTER 1    Introducing Silverlight</b> .....	<b>1</b>
Cross-Platform Frameworks .....	2
Qt .....	2
The Java Platform .....	2
Flash/Flex .....	3
Silverlight .....	3
The History of Silverlight .....	3
Creating Your First Application .....	5
Summary .....	11
■ <b>CHAPTER 2    Getting to Know XAML</b> .....	<b>13</b>
Introducing XAML .....	13
Namespaces .....	18
Dependency Property System .....	18
Type Converters .....	23
Markup Extensions .....	24
More About Silverlight Applications .....	30
Events in Silverlight.....	32
Summary .....	36
■ <b>CHAPTER 3    Creating User Interfaces</b> .....	<b>37</b>
Building Blocks .....	37
DependencyObject.....	39
UIElement .....	39
FrameworkElement .....	41

Positioning Objects on Screen .....	43
Canvas .....	44
StackPanel .....	44
Grid .....	45
Customizing Silverlight Controls .....	48
ContentControl .....	48
Border .....	49
The Button Controls .....	50
TextBlock .....	53
TextBox .....	55
ItemsControl .....	57
Popup .....	58
ToolTipService .....	59
RangeBase .....	60
ScrollViewer .....	62
Incorporating SDK Controls .....	64
GridSplitter .....	64
Calendar and DatePicker .....	65
TabControl .....	67
Implementing Navigation .....	68
Summary .....	70

## ■ CHAPTER 4    **Network Communication** .....

Enabling Cross-Domain Communication .....	71
Using Services .....	74
Creating and Using a Client Service Proxy .....	76
Communicating Over HTTP Directly .....	81
The HttpWebRequest Class .....	83
Raw Network Communication .....	86
The Socket Class .....	86
The SocketAsyncEventArgs Class .....	87
Using the Socket Class .....	88
Considerations for Using Networking .....	94
Summary .....	95

## ■ CHAPTER 5    **Working with Data** .....

Displaying Data .....	97
Data Binding .....	97
Introducing the DataGrid .....	105



Processing Data . . . . .	106
Parsing XML . . . . .	107
Serializing XML . . . . .	108
Using LINQ . . . . .	109
Saving State on the Client . . . . .	110
Summary . . . . .	115
 <b>CHAPTER 6 Working with Media . . . . .</b>	 117
Images . . . . .	117
Multiscale Images (Deep Zoom) . . . . .	121
Media (Video and Audio) . . . . .	125
Timeline Markers . . . . .	131
Silverlight Streaming . . . . .	132
Preparing an Application . . . . .	134
Packaging Images and Media . . . . .	138
Summary . . . . .	140
 <b>CHAPTER 7 Extending the User Interface . . . . .</b>	 141
2D Graphics . . . . .	141
Using Geometries . . . . .	142
Using Shapes . . . . .	147
Transforms . . . . .	151
Translation . . . . .	151
Rotation . . . . .	152
Skewing . . . . .	153
Scaling . . . . .	153
Arbitrary Linear Transforms . . . . .	154
Combining Multiple Transformations . . . . .	156
Brushes . . . . .	157
The SolidColorBrush . . . . .	158
The Tile Brushes . . . . .	158
The Gradient Brushes . . . . .	159
Summary . . . . .	162

<b>CHAPTER 8</b>	<b>Styling and Templating</b> .....	163
	Using Styles .....	163
	Using Control Templates .....	169
	Creating a Control Template .....	169
	Control Templates for Other Controls .....	178
	Developing a Templated Control .....	179
	Summary .....	181
<b>CHAPTER 9</b>	<b>Animation</b> .....	183
	Animation Basics .....	183
	Timelines .....	184
	Storyboards and Animation .....	189
	From/To/By Animations .....	190
	Keyframe Animations .....	197
	Animating with Expression Blend .....	201
	Summary .....	205
<b>CHAPTER 10</b>	<b>Dynamic Languages and the Browser</b> .....	207
	Introducing Dynamic Languages .....	207
	The DynamicApplication Class .....	209
	Creating a Dynamic Language Application .....	209
	Executing a Dynamic Language Application .....	211
	Developing with Dynamic Languages .....	212
	Interoperating with the Browser .....	216
	Summary .....	227
<b>CHAPTER 11</b>	<b>Security</b> .....	229
	Security in the CoreCLR .....	229
	Application-Level Security .....	232
	Securing Information in Transit .....	232
	Securing Information with Cryptography .....	232
	Division of Responsibility .....	244
	Summary .....	249

<b>CHAPTER 12</b>	<b>Testing and Debugging</b>	251
	Testing	251
	Unit Testing	251
	Automated User Interface Testing	258
	Debugging	260
	The Debugging Process	260
	Conditional Compilation	261
	Debugging with Visual Studio	263
	Handling Unhandled Exceptions	267
	Summary	270
<b>CHAPTER 13</b>	<b>Packaging and Deploying Silverlight Applications</b>	271
	Client Considerations	271
	Silverlight Deployment Packages	275
	Hosting Silverlight on a Web Page	278
	Silverlight Versioning	280
	Custom Initialization Parameters	281
	Resources	282
	Silverlight and the Build Process	284
	Silverlight Assemblies	290
	Summary	291
<b>CHAPTER 14</b>	<b>Advanced Topics</b>	293
	Threading	293
	The Thread Class	295
	Creating and Managing Threads	297
	The Dispatcher	299
	The BackgroundWorker Class	300
	Working with Shared Data	304
	Using Timers	308
	The DispatcherTimer	309
	The System.Threading Timer	309
	Dynamically Loading Applications	311
	Summary	313

CHAPTER 15

Case Study: Campus Explorer

315

Application Features

316

Design of the Application

316

User Interface Design

316

Data Representation

317

Packaging of the Application

320

Application Implementation

320

Helper Methods

320

XAML Organization

321

MainPage

321

Map.xaml

323

Summary

331

INDEX

333

# About the Author

■ **JEFF SCANLON** is an independent Microsoft consultant with extensive experience developing software using a variety of technologies. He designs and implements software across all layers with a focus on web-based applications. Jeff has lead developer training sessions on software engineering practices and introductions to new technologies at nearly every company he has worked with. He is the author of *Professional Java Programming with JDK 5*, and has written a number of articles on .NET for *Software Development* magazine. He holds several Microsoft certifications and a bachelor's degree in computer science from George Mason University.



# About the Technical Reviewer

■ **FABIO CLAUDIO FERRACCHIATI** is a senior consultant and a senior analyst/developer. He works for Brain Force ([www.brainforce.com/](http://www.brainforce.com/)) in its Italian branch ([www.brainforce.it/](http://www.brainforce.it/)). He is a Microsoft Certified Solution Developer for .NET, a Microsoft Certified Application Developer for .NET, and a Microsoft Certified Professional.

Fabio is a prolific author and technical reviewer. Over the past ten years, he has written articles for Italian and international magazines, and has coauthored more than ten books on a variety of computer-related topics. You can read his LINQ blog at [www.ferracchiati.com/](http://www.ferracchiati.com/).





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Any imperfections in this book are solely my responsibility, not Apress' or my technical editor's. I encourage you to leave feedback online or contact me directly so they can be addressed if necessary.

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# Introduction

**S**ilverlight is an exciting technology. There are technological aspects to Silverlight that convince me it will be a viable platform in the years ahead. I think Silverlight and its Linux implementation, Moonlight, will prove interesting to all developers, regardless of whether they have .NET experience. Silverlight brings the advantages of XAML and a CLR, and a set of useful platform libraries, to operating systems other than Windows. Someone once commented that Silverlight is where I placed my bet, and this is definitely true. I've upped the ante by investing the time and energy to write this book. *Accelerated Silverlight 2* aims to get you up to speed as efficiently as possible on Silverlight, and I hope you find what you're looking for within its pages. If you have any questions or problems, please get in touch with me using the contact information at the end of the Introduction, and I'll help. I also have a site specifically devoted to this book, [www.acceleratedsilverlight.net/](http://www.acceleratedsilverlight.net/), which provides a place for readers to get questions answered and extend some of the topics discussed in this book.

## Who This Book Is For

This book assumes you have a reasonable degree of familiarity with .NET, such as understanding what assemblies are and how to develop on the .NET platform using C#. The goal of this book is to get you up to speed on Silverlight as efficiently as possible. Although Windows Presentation Foundation (WPF) also uses XAML (which you'll learn about in Chapter 2, in case you're unfamiliar with this term), you do not need to be familiar with WPF.

## How This Book Is Structured

This book covers a significant amount of Silverlight, from the new Extensible Application Markup Language (XAML), to creating user interfaces, to the building of a real world-style application. The following subsections more specifically detail what is covered in each chapter.

## Chapter 1, “Introducing Silverlight”

This chapter discusses some of the background of cross-platform applications to help you understand where Silverlight fits into the overall technological picture. There may not be much history to Silverlight, but it did start as a version 1.0 product that featured a basic XAML parser (but no managed execution engine). This chapter concludes with using Visual Studio 2008 and Expression Blend to create your first Silverlight application.

## Chapter 2, “Getting to Know XAML”

XAML is a new declarative language. It provides an easy way to create and configure object hierarchies and relationships in markup. This chapter introduces important concepts, such as markup extensions to support handling resources and data binding, type converters for interpreting property values, dependency properties, attached properties, events, and other important aspects of XAML and Silverlight.

## Chapter 3, “Creating User Interfaces”

Silverlight provides important controls for organizing user interfaces, displaying information, and receiving user input. After discussing the important aspects of the Silverlight object hierarchy, we get right into creating user interfaces. The major layout controls are explored—the Canvas for absolute positioning, the StackPanel for organizing controls horizontally or vertically, and the Grid for placing controls in HTML-like tables. Next, all the standard user interface controls are covered, including those for creating text entry boxes, check boxes, radio buttons, and list boxes.

## Chapter 4, “Network Communication”

An online application that does not talk to other systems (or even back to its hosting server) is a rare case, so Silverlight must provide ways to interact with other systems. Unsurprisingly, Silverlight provides functionality to invoke web services and download data (such as ZIP files) from a web server. However, it might surprise you that Silverlight includes support for raw network communication, though it is subject to security restrictions.

## Chapter 5, “Working with Data”

Communicating over the network is important for getting data—but once you have data, what do you do with it? This chapter details how to connect data from a data source to the user interface using the data binding architecture. Data can be stored in a collection in the code-behind or in XML. Silverlight provides the ability to use LINQ expressions (introduced in .NET 3.5—but don’t worry, Silverlight is still completely separate from the

.NET Framework) in the code-behind, as well as support for both reading and writing XML files and serialization to and from objects. This chapter concludes with a look at how to save state on the client, mainly through the use of isolated storage—a private, secure area on disk for Silverlight applications.

## Chapter 6, “Working with Media”

Silverlight makes it easy to create rich user interfaces involving images, audio, and video. This chapter details how to access and utilize these media elements. Silverlight can be used to create sites that manage video—such as YouTube ([www.youtube.com/](http://www.youtube.com/))—or sophisticated image-browsing sites like Hard Rock Memorabilia (<http://memorabilia.hardrock.com/>). This chapter details the various media controls, including Image, MediaElement, and MultiScaleImage (also known as Deep Zoom, the MultiScaleImage control was used to create the Hard Rock Memorabilia site). The chapter concludes with a look at Silverlight Streaming, a service Microsoft provides to host both Silverlight applications and videos for streaming.

## Chapter 7, “Extending the User Interface”

Although Chapter 2 detailed many controls useful for building Silverlight applications, it only showed one aspect of Silverlight’s support for building user interfaces. This chapter returns to building user interfaces. Silverlight has support for 2D graphics, such as lines and ellipses, and even complex geometrical shapes. Almost anything that can be drawn on a user interface (such as 2D graphics or controls) can be transformed (e.g., rotated or scaled down). These transforms are discussed along with performing custom transformations by using a transformation matrix. This chapter concludes with a look at the various brushes provided by Silverlight, useful for painting colors, images, video, or even color gradients onto foregrounds or backgrounds of elements in a user interface.

## Chapter 8, “Styling and Templating”

Silverlight provides the ability to centrally manage styles that control the appearance of elements on a user interface, such as those for font face, font size, and color. It also supports the ability to completely replace the visual representation of controls using control templates. Both of these mechanisms are explored in this chapter.

## Chapter 9, “Animation”

Animation provides the ability to change the properties of user interface elements over time. This chapter discusses the support Silverlight provides for animation, beginning with an explanation of a timeline and continuing with an exploration of storyboards and the different ways to animate elements of a user interface. The chapter concludes with a look at animating using Expression Blend, an invaluable tool for easily developing and previewing animation.

## Chapter 10, “Dynamic Languages and the Browser”

A big aspect of Silverlight that is currently not officially available in .NET on Windows is the Dynamic Language Runtime (DLR). This enables the smooth execution of dynamic languages such as IronPython, IronRuby, and Managed JScript within Silverlight. After showing how to utilize dynamic languages in Silverlight applications, this chapter switches gears to the support Silverlight provides for interoperating with the browser. Silverlight provides the ability to send and receive data from the hosting browser, including invoking JScript and accessing the DOM.

## Chapter 11, “Security”

Silverlight can interact with the host operating system—for example, isolated storage ultimately writes files to disk. This direct access is impossible from your application code because all application code is considered unsafe. This forms the core of the security model for executable code in Silverlight. Beyond the security of executable code, there are other aspects at an application level that contribute to sound security in Silverlight applications. These aspects include authentication/authorization to control access, communicating over SSL, and using cryptography to protect sensitive data. This chapter explores all of these, along with how to design a Silverlight application with security in mind.

## Chapter 12, “Testing and Debugging”

Applications must be tested to prove, as best as possible, that they are bug free and work as designed. This chapter primarily focuses on unit testing—testing Silverlight applications from the perspective of a developer. A strong set of unit tests can prove a useful part of the build and verification process. When bugs are found, during development or from testing, the root cause must be discovered. This is where debugging proves useful. Debugging is more than simply attaching a debugger to a Silverlight application and tracing execution. Both proactive and reactive debugging measures are discussed.

## Chapter 13, “Packaging and Deploying Silverlight Applications”

Silverlight is a client-side technology. A Silverlight application can be placed on any web server (e.g., IIS, Apache, etc.); however, there are some benefits to deploying Silverlight on IIS 7 (primarily in the handling of video). This chapter will discuss how Silverlight applications are packaged and deployed on web servers, how they are embedded in HTML/ASPX pages, and also what is necessary to support building Silverlight applications using MSBuild.

## Chapter 14, “Advanced Topics”

One of the most frustrating things for users of an application is a frozen user interface. Long-running operations should never occur on the user interface thread, and you should be well aware of this if you’ve done any Windows Forms development. Silverlight supports several techniques to improve responsiveness of user interfaces, including asynchronous communication and threading. This chapter explores techniques to create responsive user interfaces by looking at both explicit and implicit ways of leveraging multiple threads. Silverlight also provides several timer-related classes useful for certain periodic tasks, such as providing a time signature for a video that is playing.

## Chapter 15, “Case Study: Campus Explorer”

The book concludes with the design and development of an example application that uses many aspects of Silverlight. The application provides an interactive map of a university campus and displays images/video linked to buildings on campus to give visitors to the application a good idea of what the campus is like. The key features of this application include images, video, control templating and styling, data binding, and various controls.

## Contacting the Author

You can contact the author by visiting his site at [www.artofcoding.net/](http://www.artofcoding.net/), or via this book’s site, at [www.acceleratedsilverlight.net/](http://www.acceleratedsilverlight.net/). Comments on this book can be sent directly to the author at [feedback@acceleratedsilverlight.net](mailto:feedback@acceleratedsilverlight.net).

