Foundations of WPF

An Introduction to Windows Presentation Foundation

Laurence Moroney

Foundations of WPF: An Introduction to Windows Presentation Foundation Copyright © 2006 by Laurence Moroney

All rights reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system, without the prior written permission of the copyright owner and the publisher.

ISBN-13 (pbk): 978-1-59059-760-6 ISBN-10 (pbk): 1-59059-760-5

Printed and bound in the United States of America 987654321

Trademarked names may appear in this book. Rather than use a trademark symbol with every occurrence of a trademarked name, we use the names only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark.

JavaTM and all Java-based marks are trademarks or registered trademarks of Sun Microsystems, Inc., in the US and other countries. Apress, Inc., is not affiliated with Sun Microsystems, Inc., and this book was written without endorsement from Sun Microsystems, Inc.

Lead Editor: Ewan Buckingham Technical Reviewer: John Grieb

Editorial Board: Steve Anglin, Ewan Buckingham, Gary Cornell, Jason Gilmore, Jonathan Gennick, Jonathan Hassell, James Huddleston, Chris Mills, Matthew Moodie, Dominic Shakeshaft, Jim Sumser,

Keir Thomas, Matt Wade

Project Manager: Denise Santoro Lincoln Copy Edit Manager: Nicole Flores Copy Editor: Kim Wimpsett

Assistant Production Director: Kari Brooks-Copony

Production Editor: Ellie Fountain Compositor: Gina Rexrode Proofreader: Linda Marousek Indexer: Michael Brinkman

Artist: Kinetic Publishing Services, LLC

Cover Designer: Kurt Krames

Manufacturing Director: Tom Debolski

Distributed to the book trade worldwide by Springer-Verlag New York, Inc., 233 Spring Street, 6th Floor, New York, NY 10013. Phone 1-800-SPRINGER, fax 201-348-4505, e-mail orders-ny@springer-sbm.com, or visit http://www.springeronline.com.

For information on translations, please contact Apress directly at 2560 Ninth Street, Suite 219, Berkeley, CA 94710. Phone 510-549-5930, fax 510-549-5939, e-mail info@apress.com, or visit http://www.apress.com.

The information in this book is distributed on an "as is" basis, without warranty. Although every precaution has been taken in the preparation of this work, neither the author(s) nor Apress shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this work.

The source code for this book is available to readers at http://www.apress.com in the Source Code/Download section.

Contents

About the Technic	cal Reviewer	xv
CHAPTER 1	Introducing WPF	1
	Presentation Layer Architecture: From Yesterday to Tomorrow	1
	The Windows SDK	8
	The .NET Framework	8
	Windows Communication Foundation	9
	Windows Workflow Foundation	10
	Windows Presentation Foundation	10
	Tools of the Trade	12
	Visual Studio 2005	12
	Microsoft Expression	13
	The WinFX Runtime Components	
	The Windows Software Development Kit (SDK)	14
	Visual Studio Development Tools for WinFX	14
	Summary	14
CHAPTER 2	Programming WPF Applications	15
	What Are WPF Applications?	15
	Choices in Application Distribution	17
	Choosing a XAML Browser Application	17
	Choosing an Installed Application	19
	Windows Presentation Foundation Architecture	19
	System.Threading.DispatcherObject	20
	System.Windows.DependencyObject	20
	System.Windows.Media.Visual	22
	System.Windows.UIElement	22
	System.Windows.FrameworkElement	23

	How to Program WPF Applications	
	Using the Application Object	
	Supporting Application-Level Navigation Events	
	Using the Application Object to Manage Your Windows	
	Managing the Shutdown of Your Application2	
	Window Management2	
	Using the Window Object	
	Using the NavigationWindow Object	
	Using the Page Object3	
	Managing Windows3	
	Summary3	1
CHAPTER 3	Building Your First WPF Application	3
	Getting Started3	3
	The Application3	4
	Building an Application in Expression Interactive Designer	6
	Creating the Basic Application Layout	
	Performing the Basic Data Binding4	1
	Running the Application	8
	Exploring the XAML for the Bike Browser	0
	Document Root: The Grid	i1
	Scene Resources	i1
	Triggers	2
	User Interface Definition	2
	A More Advanced WPF User Interface	5
	Setting the Background Gradient5	5
	Creating the 3D "Gel" Effect5	9
	Creating a Reflection Effect	6
	Summary6	9
CHAPTER 4	Building a Connected WPF Application	'1
	Getting Started with WCF7	2
	Creating the Service	
	Creating the WCF Service Application	
	Creating the WCF Service Project	
	Adding the Database Wrapper8	
	Adding the Service Interface	
	Creating the Front End	
	Connecting the User Interface to the Service	
	Connocing the coor interface to the correct for	Ü

	Implementing the Product Detail Service Method	99
	Implementing the User Interface for the Product Service Call	102
	Tidying Up the XAML	103
	Summary	110
CHAPTER 5	Exploring the Layout Controls	111
	Understanding Layout Basics	111
	Using the StackPanel Control	
	Getting a StackPanel Orientation	
	Docking a StackPanel	
	Using Margins in a StackPanel	
	Understanding When You Would Use a StackPanel	
	Using the DockPanel Control	
	Using Child Fills	
	Using the Grid Control.	
	Using Columns and Rows in the Grid	
	Building the UI with Columns and Rows	
	Using the Canvas Control	
	Using the TabPanel for Tabbed Layout	
	Using the WrapPanel Control	
	Setting the Wrap Flow Direction	
	Setting the Orientation	
	Summary	
CHAPTER 6	Working with XAML Controls	151
UIAI ILII U	•	
	Using the Button Control	151
	Getting Started with the Button Control	
	Using Rich Content in a Button	
	Using the CheckBox Control	
	Getting Started with the CheckBox Control	
	Using Rich Content in a CheckBox Control	
	Using the ComboBox Control	
	Getting Started with the ComboBox Control	
	Using Rich Content in a Combo Box	
	Using the Slider Control	
	Getting Started with the Slider	
	Using Tick Marks for Improved Feedback	
	Using a Selection Range in a Slider	
	Capturing Value Changes on the Slider	163

Using the Image Control	. 164
Getting Started with the Image Control	. 164
Taking Care of Memory	. 164
Cropping an Image	. 164
Rotating an Image	. 165
Converting an Image	. 166
Using the ListBox Control	. 168
Getting Started with the ListBox	. 169
ListBox Selection Modes	. 169
Using Complex List Items	. 171
Handling ListBox Events	. 173
Using the RadioButton Control	. 174
Getting Started with the RadioButton	. 174
Specifying Option Groups	
Using Complex RadioButton Types	. 175
Handling RadioButton Events	. 177
Handling Events for Complex Types	. 178
Using the Menu Control	
Getting Started with the Menu Control	
Using Complex Menu Types	. 181
Checkable Items	. 182
Using Menu ToolTips	. 183
Handling Menu Events	. 185
Using the ContextMenu Control	. 186
Getting Started with the ContextMenu	
Using the ListView Control	. 188
Getting Started with the ListView	
Handling ListView Events	
Performing Data Binding with XAML Controls	
Control Binding	
Performing XML Binding	
Using an External XML Data Source	
Object Data Source Binding	. 200
Cummary	ეტე

CHAPTER 7	Working with Graphics and Media	. 205
	Introducing the Graphics APIs	. 205
	Using Brushes	. 206
	Using Shapes	
	Performing Transformations	
	Using the Imaging APIs	
	Using Multimedia	
	Using the MediaElement Class	
	Using Transforms with Media	
	Summary	. 232
CHAPTER 8	Working with Animation	. 233
	Getting Started with Animation	. 233
	Understanding the Animation Types	. 235
	Using Keyframe-Based Animation	. 238
	Using Keyframes with a Color Animation	. 238
	Using Keyframes in a Double Animation	
	Using Key Points in a Point Animation	
	String Animations Using Keyframes	
	Animations Using Storyboards and TimeLine Classes	
	Working with Animation and Timelines with Interactive Designer	
	Assigning Animations to Events in Interactive Designer	
	Summary	. 202
CHAPTER 9	Working with 3D Graphics in WPF	. 263
	Understanding the Basics of 3D Programming	. 265
	Introducing Points	
	Introducing Vertices	. 266
	Introducing Normals	. 267
	Enough Theory, Let's See the Code	. 268
	Examining the ViewPort3D Object	
	Setting Up the Camera	
	Setting Up the Lights	
	Using Materials	
	Seeing a More Complex Example in Action.	
	Using Transforms	
	Using Translations	
	Using Scaling	
	Using Rotation Transforms	. 287

CHAPTER 10	Distributing Your WPF Applications	289
	Deploying a WPF Windows Application	289
	Publishing for Online or Offline Mode	293
	Running and Updating the Application	299
	Exploring the Installation	300
	Deploying a WPF Windows Application in Online Mode Only	302
	Building and Deploying a WinFX Web Application	306
	Configuring Web Applications for Trust	311
	Summary	312
INDEX		315