

*Flex 3* 编程 (影印版)

*Programming*

# Flex™ 3



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*Chafic Kazoun  
& Joey Lott 著*

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**Flex™ 3 编程 (影印版)**

**Programming Flex™ 3**

**O'REILLY®**

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**开明出版社**

## 图书在版编目 (CIP) 数据

Flex 3 编程 = Programming Flex 3: 英文 / (美) 洛特 (Lott, J.), (美) 凯周 (Kazoun, C.) 著. —影印本.  
北京: 开明出版社, 2009.3  
ISBN 978-7-80205-737-1

I. F… II. ①洛…②凯… III. 软件工具—程序设计—英文 IV .TP311.56

中国版本图书馆 CIP 数据核字 (2009) 第 035514 号

江苏省版权局著作权合同登记

图字: 10-2009-082 号

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书名: Flex 3 编程 (影印版)

出版: 开明出版社出版 (北京海淀区西三环北路 19 号 邮编 100089)

经销: 全国新华书店

印刷: 北京市梦宇印务有限公司 (北京市通州区张家湾镇张辛庄村)

开本: 787×1092 1/16

印张: 41.25

字数: 693 千字

版次: 2009 年 4 月 北京第 1 版

印次: 2009 年 4 月 北京第 1 次印刷

定价: 82.00 元

印刷、装订质量问题, 出版社负责调换货 联系电话: (010) 88817647

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# Foreword

I remember 2004. That was the year the Olympics were held in Greece. Oil rose above \$50 per barrel. *The Return of the King* swept the Oscars. The Red Sox won the World Series. The Serendib Scops Owl was discovered in Sri Lanka... What a year! Okay, that last one I ripped off from Wikipedia. But 2004 *was* a big year for those owls... and it was also a big year for Internet applications. It was the year Flex was born.

A lot has changed in just a few short years. Flex 1 was very exclusive and its applications were tied to a server. It required expensive licenses and few resources were available to help you out. Flex 1.5 cut the cord between the application and the server. Suddenly, anyone could write and deploy a killer Flex app, but most folks still had not heard of Flex. When Flex 2 came out, it was really making some headway into the mindshare of rich Internet application (RIA) developers, even as the industry struggled to define what a RIA developer was. Flex got more and more press, and the SDK was finally released for free. By the time the 2.0.1 update shipped, Flex had an impressive following of designers, developers, so-called *devigners*, and that rarest of beasts, the Serendib developer.

And now comes Flex 3, the most complete and usable version of Flex yet. You get a profiler, OLAP, CS3 integration, refactoring, framework RSLs, deep linking, an AJAX bridge, code generation for servers, automation, just about everything you could dream of. And if something isn't in the box, you can bet someone in the community is working on it: frameworks, 3D libraries, maps, mashups, configurators, dashboards, monitors, widgets, you name it.

But with all those new features and functionality, what's the biggest change in Flex 3?

Well, it's not a new feature, or a refactored API. It's not the splashy new box cover, and it's not the low, low price. It's not even that snazzy new "Getting Started Experience." No, it's none of these things. To see the biggest change in Flex 3, to really see it, you need to stand up, walk down the hall, step into the bathroom (after knocking politely, of course), and look in the mirror. The biggest change in Flex 3 is *you*. That's right. With Flex 3, you, I, or anyone else can contribute to the open source Flex SDK. You can stick your hand into the belly of the beast, tweak its spleen, sew it up, and

reawaken a whole new beast. With just a text editor and an Internet connection, you can become a contributor on this leading RIA technology.

So, where does this book fit in? Looking at the existing Flex 3 product documentation, I see more than 2,300 pages of content and nearly 1,200 example applications. I even wrote a couple of those, although if you corner me with a compiler error, I'll deny it. And that doesn't even include the Language Reference, with thousands more "virtual" pages of developer doc. So, why do we need a book about Flex 3 if so much content is already available?

Well, when they wrote *Programming Flex 2*, the first edition of this book, Chafic and Joey learned how to use Flex 2 from the outside in. This was before the source code was even available to look at. They managed to figure out how to do such things as work with remote data, navigate the complexities of the Flex layout schemes, and create incredible custom components. They were real developers solving real problems and writing real code. I remember looking at many of the topics in that edition and saying to myself, "I wish I had written that." These guys took incredibly complex topics and distilled them into the information you needed.

For this edition, Chafic and Joey looked at the product from the inside out. They peeled back the skin and saw the sinewy skeleton of a dynamic framework that will define the next generation of web apps. If you're designing a video player, there's a chapter for you. If you've got a yen for currency formatters, this book has you covered. If you just want to get a handle on the application life cycle, you came to the right place.

So, this book will tell you what Flex 3 is. And after you read it, you might discover something that Flex 3 isn't. But now there's something you can do about it. At some late hour, when everyone else is asleep, if the inspiration strikes you, you might screw up your courage and heap on the moxie, and put your mark on the Flex world by joining the forces at <http://opensource.adobe.com/flex>. This book is just the beginning.

—Matt Horn  
Adobe

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# Preface

It literally took us several years to write *Programming Flex 2*, the predecessor to this book. We worked hard on that book, and when it was finally written and edited and proofread and off to the printer we sighed and looked forward to a break from writing about Flex. However, Flex 3 followed close on the heels of Flex 2, and as the saying goes, there's no rest for the weary. We again picked up our keyboards and started updating the book for Flex 3. The result is what you have in your hands. And it is more than a simple update.

We thought *Programming Flex 2* was one of the best books available for Flex 2. However, we knew we could do better. There were topics we just didn't have time to include in that book. With *Programming Flex 3* we wanted to not only update the book for Flex 3, but also expand our coverage to include things that weren't in the first book. We think we achieved that goal.

The most notable additions to *Programming Flex 3* are in Chapter 20, Chapter 21, and Chapter 22. In Chapter 20, we go into great detail on everything you need to know to add Flex applications to web pages, which we think is an important (if not crucial) topic. Chapter 21 covers building Adobe AIR desktop applications using Flex. And Chapter 22 contains the synthesis of everything else we discuss throughout the book. This is the one addition we think is perhaps the most important, since it helps explain how to take everything you've learned about Flex in preceding chapters and use that knowledge to build a real-world application.

However, we didn't merely add new chapters to the book. We also revised and updated all the chapters in the book. Some chapters didn't require much updating because there were minimal changes for the relevant features between Flex 2 and Flex 3. On the other hand, other chapters required extensive updates and additions. If you read *Programming Flex 2* then you'll find lots of new or revised content in this book.

Flex 3 is huge in scope, even bigger than Flex 2. Although the learning curve is not steep (it's actually very easy to get started building Flex 3 applications), it is a long learning curve simply because of the massive amount of features packed into the framework. The official Flex documentation is quite good at telling you how to do something once you know what you're looking for. Therefore, we made it our goal to present to you a book that fills in the gaps and helps you to get comfortable enough with Flex that you

can start using it right away. It is our intention in this book to provide you with practical advice from our own experiences learning Flex, and from our longer-term experiences building rich Internet applications using Flash Platform technologies.

We really feel that Flex 3 is a fantastic product and a great way to build applications. Although this is a technical book, we have poured our enthusiasm into our writing, and we'd like to think you will share our enthusiasm as you read this book. We feel that Flex 3 is a far better way to build rich Internet applications than any alternative currently on the market, and we think that as you read this book and learn how to work with Flex, you'll agree. With Flex, you have few (if any) problems involving cross-browser compatibility, network data communication is a snap, and the framework is built with solid object-oriented principles and standards in mind. In short, we feel it's the fastest way to build the coolest, most stable applications.

## Who This Book Is For

This book is intended for anyone looking to learn more about Flex 3. We recognize that the audience for this book represents a very diverse group of people with many different backgrounds. Some readers may already be experts at working with Flex 2 (though they may be new to Flex 3), whereas others may never have heard of Flex before picking up this book. Some readers may have years of experience working with Flash Platform technologies, and others may be completely new to creating content that runs in Flash Player. Some readers may have computer science degrees or may have worked in the software industry for years. Yet others may be self-taught. We have done our best to write a book that will cater to this diverse group.

However, be aware that to get the most from this book, it is best that you have a solid understanding of object-oriented principles and that you are comfortable with understanding concepts such as runtime environments, byte code, and compilers. Furthermore, you will get the most from this book if you already know ActionScript, Java, C, C#, or another language that uses similar syntax. Although we did include a chapter dedicated to covering the basics of ActionScript (the programming language that Flex applications utilize), we don't discuss any of the core APIs in detail. If you are interested in learning more about the ActionScript language, we encourage you to find a good ActionScript 3.0 book such as *Essential ActionScript 3* and *ActionScript 3 Cookbook*.

## How This Book Is Organized

We spent a lot of time organizing and reorganizing the content of this book. Although there is likely no one way to present the content that will seem perfect to all readers, we've done our best to present it in an order that we feel makes sense:



### *Chapter 1, Introducing Flex*

What is Flex? What are rich Internet applications (RIAs)? This chapter answers these questions, providing a context for the rest of the book.

### *Chapter 2, Building Applications with the Flex Framework*

In this chapter, we discuss the various elements and steps involved in building a Flex application. Topics include using the compilers, building scripts, and more.

### *Chapter 3, MXML*

MXML is the declarative language used by Flex. In this chapter, you'll learn the basics of MXML.

### *Chapter 4, ActionScript*

ActionScript is the object-oriented programming language used by Flex. In this chapter, you'll learn the basics of ActionScript 3.0.

### *Chapter 5, Framework Fundamentals*

Flex vastly simplifies many aspects of building applications. Although you don't often have to look under the hood, understanding the fundamentals of how the framework works is useful. In this chapter, you'll learn about Flex application life cycles, bootstrapping, and more.

### *Chapter 6, Managing Layout*

Flex provides many layout containers that allow you to quickly and easily create all sorts of layouts within your applications. This chapter explains how to work with those containers.

### *Chapter 7, Working with UI Components*

In this chapter, you'll learn about the user interface components (buttons, lists, menus, etc.) that are part of the Flex framework.

### *Chapter 8, Customizing Application Appearance*

Customizing the appearance of Flex applications is important because it allows you to create applications that adhere to a corporate style guide or to a creative vision. This chapter explains how to change the appearance of Flex applications.

### *Chapter 9, Application Components*

To make Flex application development manageable it's important to know how to break up the application into discrete parts. This chapter discusses strategies for this.

### *Chapter 10, Framework Utilities and Advanced Component Concepts*

Once you've learned the basics of working with components, you'll likely want to know how to expand on that knowledge. In this chapter, you'll learn about such topics as tool tips, customizing lists, pop-up windows, and more.

### *Chapter 11, Working with Media*

Flex allows you to include all sorts of assets and media in your applications, from images to animations to video and audio. In this chapter, you'll learn how to work with these elements.

### *Chapter 12, Managing State*

Flex applications and components within those applications can change from one view to another. Flex refers to these changes as *states*. Sometimes managing state is as simple as adding a new component to a form, and other times it involves changing the entire contents of the screen. How to manage state is the subject of this chapter.

### *Chapter 13, Using Effects and Transitions*

For animated changes between states or in response to user events or system events, Flex includes features called *transitions* and *effects*. You will learn about transitions and effects in this chapter.

### *Chapter 14, Working with Data*

In this chapter, you'll learn how to model data in Flex applications as well as how to link components so that they automatically update when data values change.

### *Chapter 15, Validating and Formatting Data*

In this chapter, you'll learn how to validate user input and how to format data such as numbers, phone numbers, and so on.

### *Chapter 16, Client Data Communication*

Client data communication is any transfer of data into or out of Flash Player where the data remains on the client computer. Examples of this are communication between two or more Flex applications running on the same computer, and storing persistent data on the computer. These topics are discussed in this chapter.

### *Chapter 17, Remote Data Communication*

In this chapter, you'll learn how to communicate from a Flex application running on a client computer to a remote data service. In the process, you'll learn how to use XML, SOAP, AMF, and more.

### *Chapter 18, Application Debugging*

Debugging applications is just as important as writing them. It's unusual to build an application that has no errors, and therefore it's crucial that you be able to track down those errors efficiently. In this chapter, you'll learn how to work with the debugging features of Flex.

### *Chapter 19, Building Custom Components*

Custom components are an important part of Flex applications because they allow you to create elements that can be used, customized, and distributed. This chapter discusses the steps necessary to create custom components using the Flex framework.

### *Chapter 20, Embedding Flex Applications in a Web Browser*

Many (if not most) Flex applications are deployed on the Web. That requires embedding Flex applications in web browsers. In this chapter, we talk about strategies for achieving this, as well as how to integrate Flex applications with browsers for back and forward button functionality and deep linking features.

### *Chapter 21, Building AIR Applications*

In this chapter, you'll learn how to use Flex to build desktop applications that run on the Adobe AIR runtime environment. This allows you to use your Flex skills to build applications that also have access to desktop-only features such as the local filesystem and system-level drag-and-drop.

### *Chapter 22, Building a Flex Application*

This chapter looks at the challenge of building a complete and working Flex application. In this chapter, you'll get a chance to examine different architectural challenges and possible solutions.

## What You Need to Use This Book

To use this book, you should have the Flex SDK and a text editor. Our intention with this book is that those with the (free) SDK can follow along. However, we recommend that anyone who is serious about developing Flex applications use Flex Builder. If you're just starting with Flex, you might want to use the free trial version of Flex Builder initially for an optimal experience building Flex applications.

## Conventions Used in This Book

The following typographical conventions are used in this book:

### *Italic*

Indicates new terms, URLs, email addresses, filenames, file extensions, pathnames, directories, and Unix utilities

### **Constant width**

Indicates commands, options, switches, variables, attributes, keys, functions, types, classes, namespaces, methods, modules, properties, parameters, values, objects, events, event handlers, XML tags, HTML tags, macros, the contents of files, and the output from commands

### **Constant width bold**

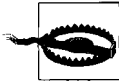
Shows commands and other text that should be typed literally by the user

### *Constant width italic*

Shows text that should be replaced with user-supplied values



This icon signifies a tip, suggestion, or general note.



This icon signifies a caution or warning.

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## Acknowledgments

This book, perhaps more than most, represents the efforts and contributions of many people. We'd like to acknowledge the following individuals.

Many thanks are due to the many folks at O'Reilly who made this book possible. Special thanks to Steve Weiss and Audrey Doyle, not only for their hard work and patience on this book, but also for their longevity for having also seen us through the previous book. We'd also like to thank Dennis Fitzgerald for keeping us on task and as close to our deadlines as possible. We don't envy Dennis's job, since he had to push and prod us every week, but we are thankful for it. Each of these individuals has continuously gone above and beyond the call of duty, and we very much appreciate their efforts.

We'd also like to thank the many people at Adobe for working to create such a fantastic product as Flex 3, as well as for answering our questions and helping us to see what things we might have missed. We'd especially like to thank a few select people who helped with this book, or who provided content we included from the previous book: Matt Chotin, Alex Harui, Andrew Spaulding, and Manish Jethani, who not only answered our questions, but also took the time to review our chapters and provide valuable comments. We're also very grateful to Matt Horn from Adobe for graciously accepting our invitation to write the Foreword to this book.

The technical quality of this book is not due just to the work of the authors. The technical editors for this book dedicated hours and hours of time to tell us when we were wrong so that we could correct it before you read it. Therefore, we'd like to thank this book's technical editors, Romin Irani and Derek Wischusen.

## From Chafic

I would first like to thank Joey. Working with him has been more than a pleasure. His experience in both the technical realm and the publishing industry, along with his patience throughout the process, were an asset to completing this book to the highest standards possible. I would also like to thank my friends, my family, and my team at Atellis for their support.

## **From Joey**

I'd like to thank Chafic for asking me to participate in writing this book. It is an honor to work with Chafic. He is a perfectionist in the best possible way, and he sets high standards that I think show in this book. I would also like to thank my colleagues at The Morphic Group for their helpful comments on the book. And I would like to thank my friends and family for their generosity of spirit.

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