

ANTONIO DE DONATIS

AdvancED ActionScript Components

Mastering the Flash Component Architecture

Learn how to design component-based applications that work well and look great.

Discover how advanced OOP techniques are applied to the Flash component architecture.

Master the use of every standard component included in both Flash 8 and Flash MX2004.



CONTENTS

About the Author	xvii
About the Technical Reviewers	xviii
About the Cover Image Designer	xix
Acknowledgments	xx
Introduction	xxi

PART ONE INTRODUCING THE ARCHITECTURE 1

Chapter 1 OOP in Component Design	3
A very short history of the architecture	4
Creating Flash components	4
An apparently useless component	5
Creating the Vogon component	5
Adding a method	7
Variables, properties, and metadata tags	8
Implementing a property explicitly	9
Implementing a property implicitly	11
Properties in the authoring environment	12
Inheritance	14
A little help from Darwin	15
Appreciating the benefits of inheritance	17
ActionScript limit on multiple inheritance	19
Events	20
What is an event in component terms?	21
Implementing a custom event	21
Triggering a custom event	21
Listening to a custom event	23
Building the example	23
Polymorphism	26
And God took a rib from a Vogon	26
A method's signature	29
Appreciating the benefits of polymorphism	30
Summary	31

Chapter 2 Core Classes and Component Design	33
The legacy of the UIObject class	36
Creating a component instance dynamically	37
Overriding the symbolName property	38
Overriding the symbolOwner property	38
Overriding the className property	38
The createClassObject method	39
Our components join the architecture	40
Inside the process of building a component instance	44
Step 1: Initialization	44
Step 2: Creating the children	45
Step 3: Drawing the component instance	45
Refining our sample components	46
The component framework	51
The UIComponent class	51
Accessibility/Keyboard use	51
Other features of the UIComponent	52
The View class	53
The ScrollView class	54
An ActionScript template for new components	54
Summary	57
Chapter 3 Exploring the UI Components	59
The Reusability Card	60
Frequency (of use)	61
Complexity	62
Stability	62
Maturity	63
Popularity	64
Multitier applications	64
UI components provided with Flash	65
Button components	65
Button component	66
CheckBox component	66
RadioButton component	67
Text components	67
Label component	68
TextInput component	68
TextArea component	69

Cell-structured components	69
List component	70
ComboBox component	70
DataGrid component	71
Tree component	72
Container components	72
ScrollPane component	73
Loader component	74
Window component	74
Accordion component	75
Peculiar components	76
Alert component	76
DateChooser component	77
DateField component	78
Menu component	78
MenuBar component	79
NumericStepper component	80
ProgressBar component	80
UIScrollBar component	81
Using the UI components	82
A first example of interaction	82
Typical structure of a component	85
The actions layer	87
The assets layer	87
The bounding box layer	88
Summary	88
Chapter 4 Building Component-based Applications	91
Screens	92
Building an application using screens	93
Content hierarchy in nested screens	95
Reviewing the purpose of slides and forms	96
Forms visibility	98
Conclusion: should you use slides or forms?	99
Screen hierarchies with external subtrees	99
The complete path to an external screen	101
Creating a slide presentation dynamically	102
Building the example	103
Importing the Slide class	108
Creating the screen hierarchy dynamically	108
Adding navigation in the master screen	109
Implementing the buttons-based navigation	110
Using Loader components in the child screens	111
Introducing the transitions	111
Importing the transition classes	112
Screen events and transition sequencing	113
Working with forms	114

Manager classes	114
Managing depth	115
MovieClip methods for handling depth	115
A more flexible way of stacking objects	116
Testing the DepthManager behavior	118
Managing the keyboard focus	120
Defining a focus schema	121
Setting a default button	123
Tab order in a browser	123
Disabling the focus rect	124
Managing windows	124
A simple window-based system	124
Creating a window instance	126
Experimenting with modal windows	127
Summary	128
PART TWO EXPLOITING THE ARCHITECTURE	129
Chapter 5 Architecture-based Development	131
Exploiting the architecture	132
Key benefits of a component architecture	132
What is your job, really?	133
Raising the bar	134
Extend, expand, and alter	134
Extending the architecture	134
Expanding the architecture	136
Altering the architecture	137
From abstract ideas to a concrete example	137
What is an XML layout engine?	138
Benefits of an XML layout engine	138
Further benefits in the Flash context	140
XLEFF	140
XLEFF main features	144
Beyond generating user interfaces	144
XLEFF internal architecture	145
Summary	146
Chapter 6 XML for Defining User Interfaces	149
Basics of the XML data structure	150
The Color Names section	151
The Styles section	151
Class styles	152
Predefined styles	153
Nested styles	153
Custom styles	154
The Stage section	155

XLEFF sampler	158
How to use it	159
Playing with the sampler	161
Examining a more complex user interface	164
User interface patterns	165
A first look into the substructures	166
Using custom classes	167
Events to be handled	169
Summary	169
Chapter 7 Extending the Application Framework	171
Defining an FLA template	172
Using scenes	173
The Preloader scene	174
The Dynamic Assets scene	176
The Main scene	178
Licensing issue	179
Including the standard components source code	179
Progressive update of the template	181
Analyzing the size report	181
Moving the symbols after the first frame	182
Moving the classes after the first frame	183
Defining a folder structure	183
The role of classpath	185
Facilitating event-driven programming	186
The Main class	187
A concrete example	188
Skeleton of the Main class	189
Handling the user interface events	190
Event handler naming convention	194
Managing content	194
Pushing the separation paradigm further	196
The role of CDATA	197
Summary	198
Chapter 8 Making Your XML Life Easier	201
Parsing XML in ActionScript	202
Object models and trees	204
The typical job of an XML developer	207
Simplifying the parsing process	209
Parsing an XML document	210
Document root and other nodes	211
Identifying a node name	211
Identifying a node type	212
Accessing the attributes of a node	214
Browsing the structure of an XML document	215
A few notes on the use of XModel	217
Summary	217

Chapter 9 The Customization Process	219
Working with styles	220
Parameters controlled by styles	221
The style lookup process	221
Styles as properties of a component instance	222
The styleName property	223
Class-level styles	225
Inheriting styles from a container	226
Global styles	227
Analyzing skins	228
What is a skin?	228
Handcrafted skins	228
Mixed skins	231
Purely coded skins	234
Working with themes	236
Changing skins and the mirage of code separation	236
Changing skins at authoring time	237
Changing skins programmatically	240
Skins that reflect styles	243
In search of a unified approach: subclassing	245
An alternative to subclassing	249
Summary	249

PART THREE CUSTOMIZING THE COMPONENTS 251

Chapter 10 The Accordion Component	253
A minimal example	254
Code-based version	255
Codeless version	256
XLEFF version	257
The component structure	257
Segment header	258
Segment content area	258
A richer example	259
Codeless version	259
Code-based version	261
Supported styles	262
Common styles	263
Specific styles	265
Skinnability	265
The border	265
The headers	266
Solved mysteries	268
Inheriting styles	268
Creating header styles on a per-instance basis	271
Reasons for subclassing	273

Chapter 11 The Button Component	275
Minimal example of the Button component	276
A richer example	277
Supported styles	279
Common styles	280
Specific styles	281
Halo theme case	281
Sample theme case	282
Skinnability	284
Replacing the purely coded skin	285
The 32 skins of a button	289
Implementing a toggle button	289
Emphasizing a button instance	289
Iconic buttons	289
Solved mysteries	290
A purely coded classic: the pill button	290
Reasons for subclassing a Button component	293
Chapter 12 The CheckBox and RadioButton Components	295
Minimal example of the CheckBox and the RadioButton components	296
XLEFF version	297
Comparing the authoring parameters	297
Supported styles	298
Common styles	298
Specific styles	300
Skinnability	302
Solved mysteries	305
Where to find the RadioButtonGroup instance	305
Reasons for subclassing the CheckBox and the RadioButton components	307
Chapter 13 The List, ComboBox, and DataGrid Components	309
Minimal example including the List, ComboBox, and DataGrid components	310
XLEFF version	313
Richer examples	314
Itemization	315
Custom labels	317
Scrolling	320
Sorting	323
Selection management	327
Making it editable	331
Supported styles	333
Common styles	336
DataGrid-specific styles	336
List-specific styles	337
ComboBox-specific styles	337

Skinnability	338
Solved mysteries	339
Cell rendering	339
Building a custom cell renderer	343
DataGrid column headers	345
The undefined item bug	346
Reasons for subclassing the List, ComboBox, and DataGrid components	347
 Chapter 14 The DateChooser and DataField Components	349
Minimal example of the DataChooser and DataField components	350
XLEFF version	351
A richer example	351
Code version	353
How to retrieve and set a date	353
Ranges definition	355
The scroll event	358
Supported styles	360
Common styles	360
Specific styles	360
Skinnability	363
Skinning the arrow buttons	363
Skinning the DataField icon	365
Solved mysteries	366
Displaying the date in custom format	367
A DataField bug	367
Reasons for subclassing the DataChooser and DataField components	369
 Chapter 15 The Loader, ScrollPane, and ProgressBar Components	371
Minimal examples	372
A minimal example of the Loader component	372
A minimal example of the ScrollPane component	375
A minimal example of the ProgressBar component	377
The ProgressBar's animated behavior	377
The indeterminate ProgressBar	379
XLEFF versions	381
Combined examples	381
The ProgressBar communication modes	382
Codeless interaction	382
ProgressBar and Loader interaction	382
ProgressBar and ScrollPane interaction	384
Mediated interaction	385
Supported styles	387
Skinnability	389
Solved mysteries	392
Reasons for subclassing	393

Chapter 16 The Menu and MenuBar Components	395
Minimal examples	396
Minimal example of the Menu component	396
Minimal example of the MenuBar component	398
Richer examples	399
Generating richer menus by coding	399
Generating richer menus using XML	405
XLEFF version	408
Supported styles	409
Stylizing the MenuBar (and its Menu instances)	409
Common styles	409
Specific styles	410
Exploring the styles	410
Skinnability	414
Solved mysteries	417
Further customization of a MenuBar skin	417
Creating persistent Menu instances	420
Reasons for subclassing the Menu and the MenuBar components	424
 Chapter 17 The NumericStepper Component	 427
Minimal example of the NumericStepper component	428
XLEFF version	429
Retrieving the value	429
Minor bug for Flash MX 2004 users	431
Styles supported by the NumericStepper component	431
Skinning the NumericStepper component	433
Solved mysteries	435
Reasons for subclassing the NumericStepper component	437
 Chapter 18 The TextArea, TextInput, and Label Components	 439
Minimal example	440
XLEFF version of the minimal example	442
How the Label component resizes automatically	442
The text field inside	445
Richer example of the TextInput and TextArea components	446
Handling the input process	446
Supported styles	448
Note on the skins	450
Solved mysteries	450
Hiding the background	451
Handling the combination linefeed/CR	453
Reasons for subclassing the Label, TextInput, and TextArea components	456

Chapter 19 The Tree Component	459
Minimal example of the Tree component	460
XLEFF version of the minimal example	464
Supported styles	465
Color styles	466
Text styles	466
Animation styles	466
Icon styles	467
Other component-specific styles	467
A note on skins	467
Stylizing the minimal example	468
Solved mysteries	470
Taking full control	471
Implementing isBranch and other XML attributes	477
Reasons for subclassing the Tree component	480
Chapter 20 The Window and Alert Components	483
Minimal example of the Window and Alert components	484
Dynamically creating windows	487
Dynamically creating alerts	489
Managing the content of a Window instance	490
Supported styles	495
Skinning the Window and Alert components	499
Skin properties of the Window component	499
Skin properties of the Alert component	500
Adding skins to our previous stylized example	500
Reasons for subclassing the Window and Alert components	505
Chapter 21 Handling the Scrollbars	507
Minimal example of the UIScrollBar component	508
Customizing the scrollbars inside a component	510
Step 1: Building a stylized version of the DataGrid component	510
Step 2: Skinning the scrollbars	512
Conclusion	519
PART FOUR APPENDIXES	521
Appendix A Locating the Source Code of the Component Architecture	523
If you are a Windows user	524
If you are a Mac user	525
FLA source files	525
Link them	526

Appendix B Transitions and Easing Classes	529
Parameters common to all of the transition types	530
Easing classes	531
Transition-specific parameters	532
The Blinds transition	532
The Fly transition	532
The Iris transition	532
The PixelDissolve transition	532
The Rotate transition	532
The Squeeze transition	533
The Wipe transition	533
Example of a transition parameters object	533
Index	535