ESRI Developer Summit

March 22–25, 2010
Palm Springs, CA

Patterns and Best Practices for Building Applications with ArcGIS API for Flex

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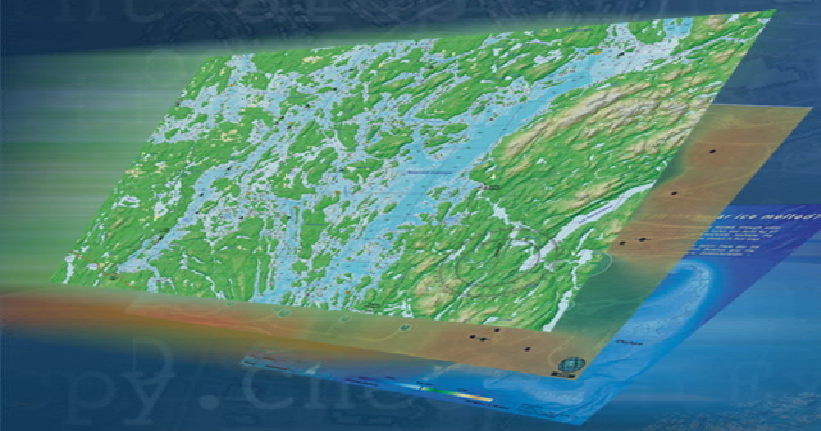


ESRI

Agenda

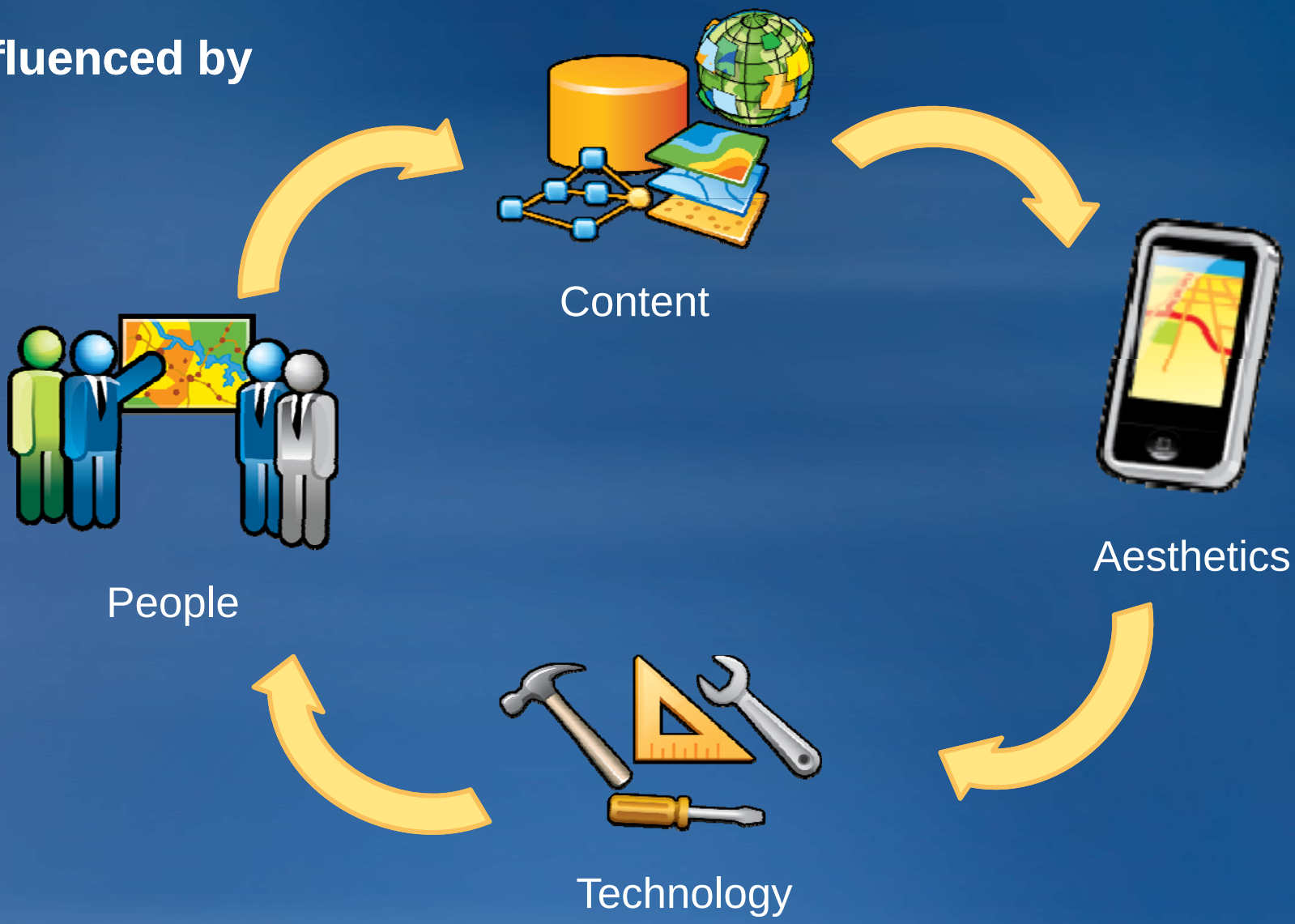
- Today we will cover
  - User experience
  - Implementation

- We will answer questions at the end of the session

Please complete the session survey!

Great Web Applications

- **Influenced by**



User eXperience

Paths to Good UX

- Concepts in Flex
  - Styling
  - Skinning
  - Effects
  - States
  - Layouts
  - Custom components
- Tools
  - Flash Builder
  - Flash Catalyst
  - Adobe Creative Suite (CS4)

New Packages in Flex 4

Flex 3

mx Packages

mx.controls.*
mx.containers.*
mx.effects.*
mx.events.*
mx.graphcs.*
mx.manangers.*
. . .

Flex 4

spark.components.*

Application
Border
Button
ButttonBar
CheckBox
Drop
Gro
List
Skin
. . .

spark.layouts.*

BasicLayout
HorizontalLayout
TileLayout
VerticalLayout
. . .

spark.effects.*

Animate
AnimateColor
Fade
Move
Move3D
Rotate
Rotate3D
Resize
. . .

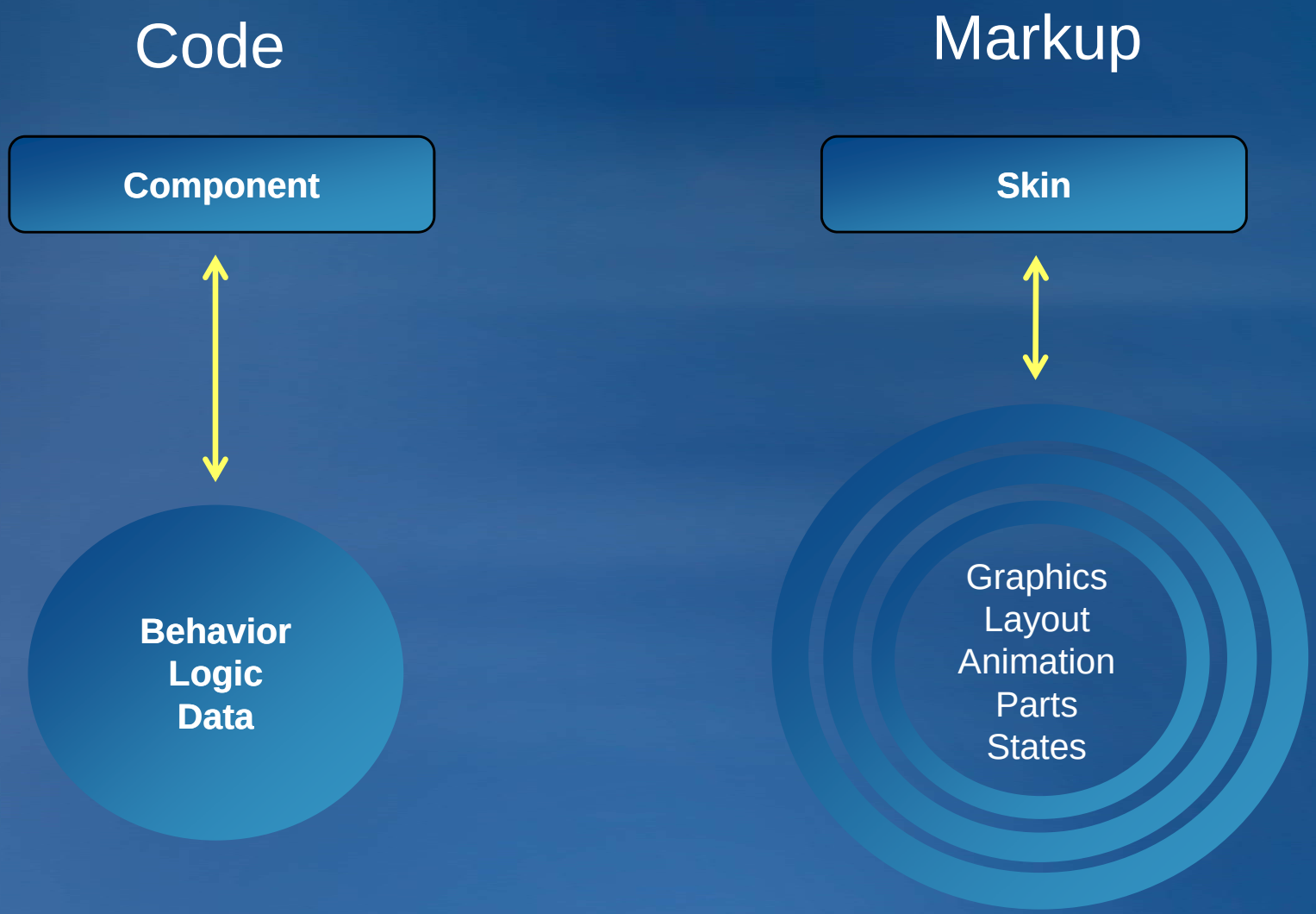
spark.primitives.*

BitmapImage
Ellipse
Graphic
Line
Path
Rect
VideoElement
. . .

Namespaces in Flex 4

- MXML 2006 Language namespace
  URI http://www.adobe.com/2006/mxml
  Default Prefix: mx
- MXML 2009 Language namespace
  URI http://ns.adobe.com/mxml/2009
  Default Prefix: fx
- Spark component namespace. Use with MXML 2009 Language namespace
  URI library://ns.adobe.com/flex/spark
  Default Prefix: s
- MX component namespace. Use with MXML 2009 Language namespace
  URI library://ns.adobe.com/flex/halo
  Default Prefix: mx

Spark Component Model



Styles

- Type selectors need namespaces
- Spark components don’t support Halo theme

```
<fx:Style>
        @namespace s "library://ns.adobe.com/flex/spark";
        @namespace mx "library://ns.adobe.com/flex/mx";
         s | Button {
                color: #FF0000;
         }
        mx | DateChooser {
                color: #FF0000;
         }
</fx:Style>
```

Declarative Graphics

- New graphic primitives for drawing lines, ellipses and curves
- Two types of graphics
  - Static / Optimized FXG (.fxg files)
  - Runtime FXG / MXML Graphics

```
<s:Rect width=“50” height=“50” >
        <s:fill>
                <s:SolidColor color="0x2D92C7" />
        </s:fill>
        <s:stroke>
                <s:SolidColorStroke color="#cccccc” weight="1"/>
        </s:stroke>
</s:Rect>
```

States

- Help represent different visual behavior
- Use attributes includeIn & excludeFrom

```
<s:Button label="Submit" includeIn="completeState" />

<s:Button label="Clear" excludeFrom="resetState" />
```

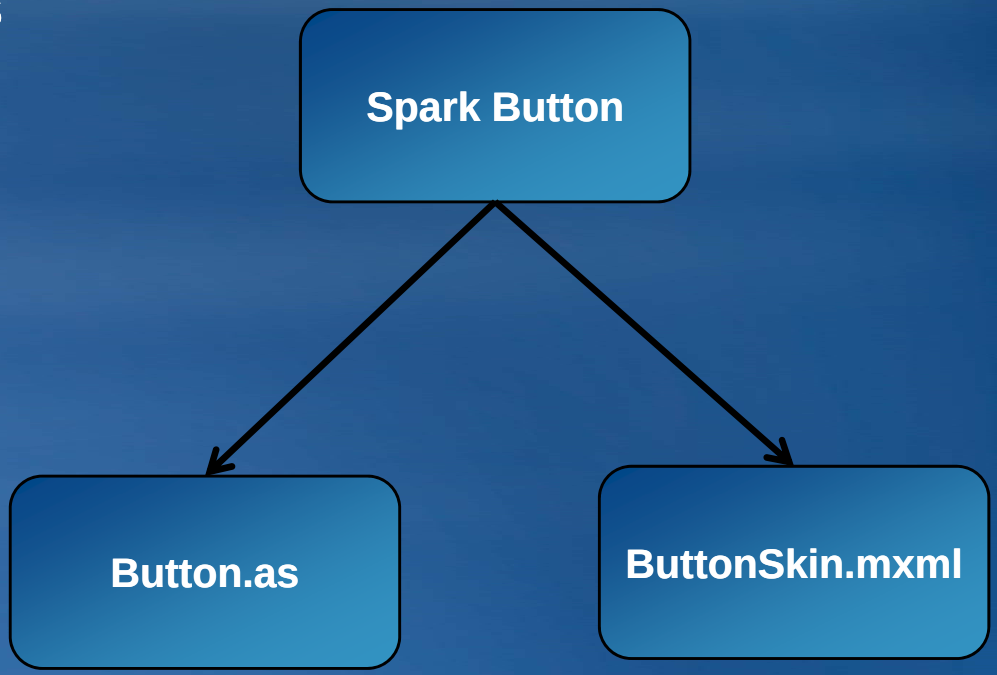
- New dot syntax

```
<s:TextInput color.errorState="0xFF0000"
        color.validState="0x000000" />

<s:Button click.submitState="submit()"
        click.clearState="resetForm()" />
```

- Sates are used in Skin files

Skins

- Components all have separate skin files (e.g. ButtonSkin.mxml)
  - Skin parts drawn with MXML graphics
  - Skins define states
- To customize components
  - Styles
  - Custom Skin



Skinning Workflow

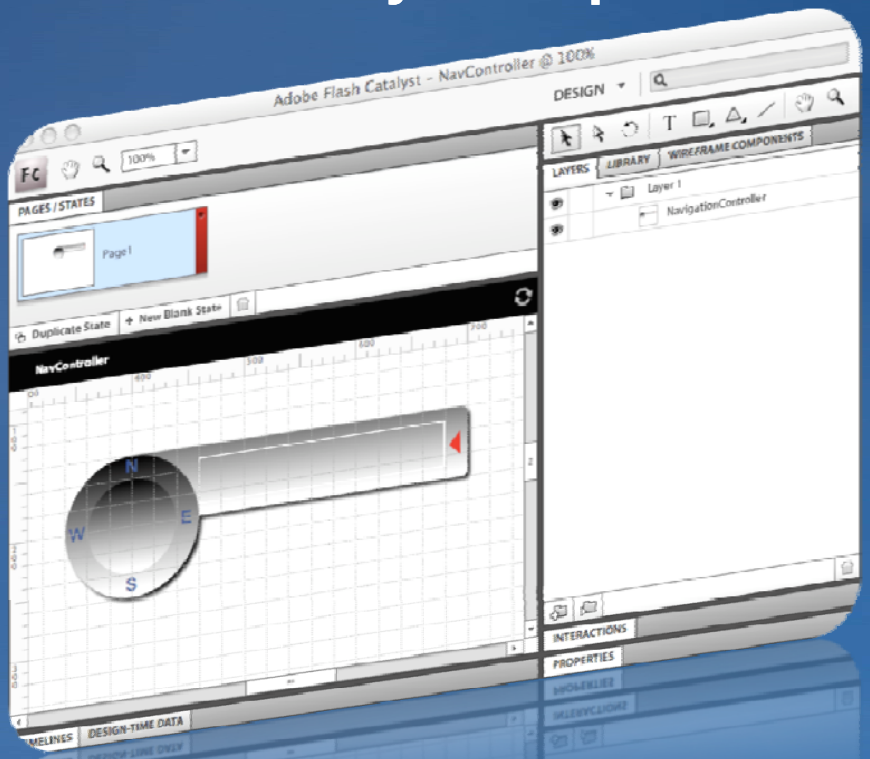
- Copy skin class
- Rename that skin
- Make modifications
- Skins should have
  - HostComponent defined
  - States
  - MXML Graphics

- Use the skinClass property to assign the custom skin

Custom Components

- Wraps reusable functionality
- Division of labor
- Enhances maintainability

- Flash Catalyst simplifies component creation



Summary

- Enhance and create unique user experience
  - Custom skins
  - Custom components
- Do not design in isolation
- Consider interconnections with
  - Context
  - Content
  - Users

Implementation Design

Debugging

```
trace( “m_value =”, m_value);
```

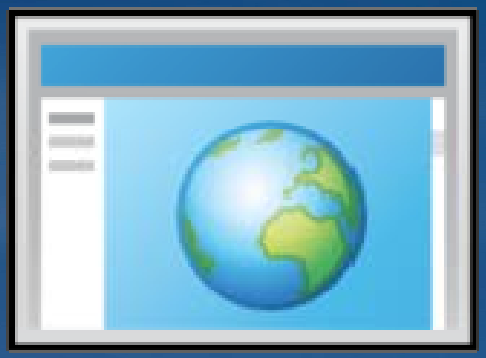
Debugging

- De Monster Debugger

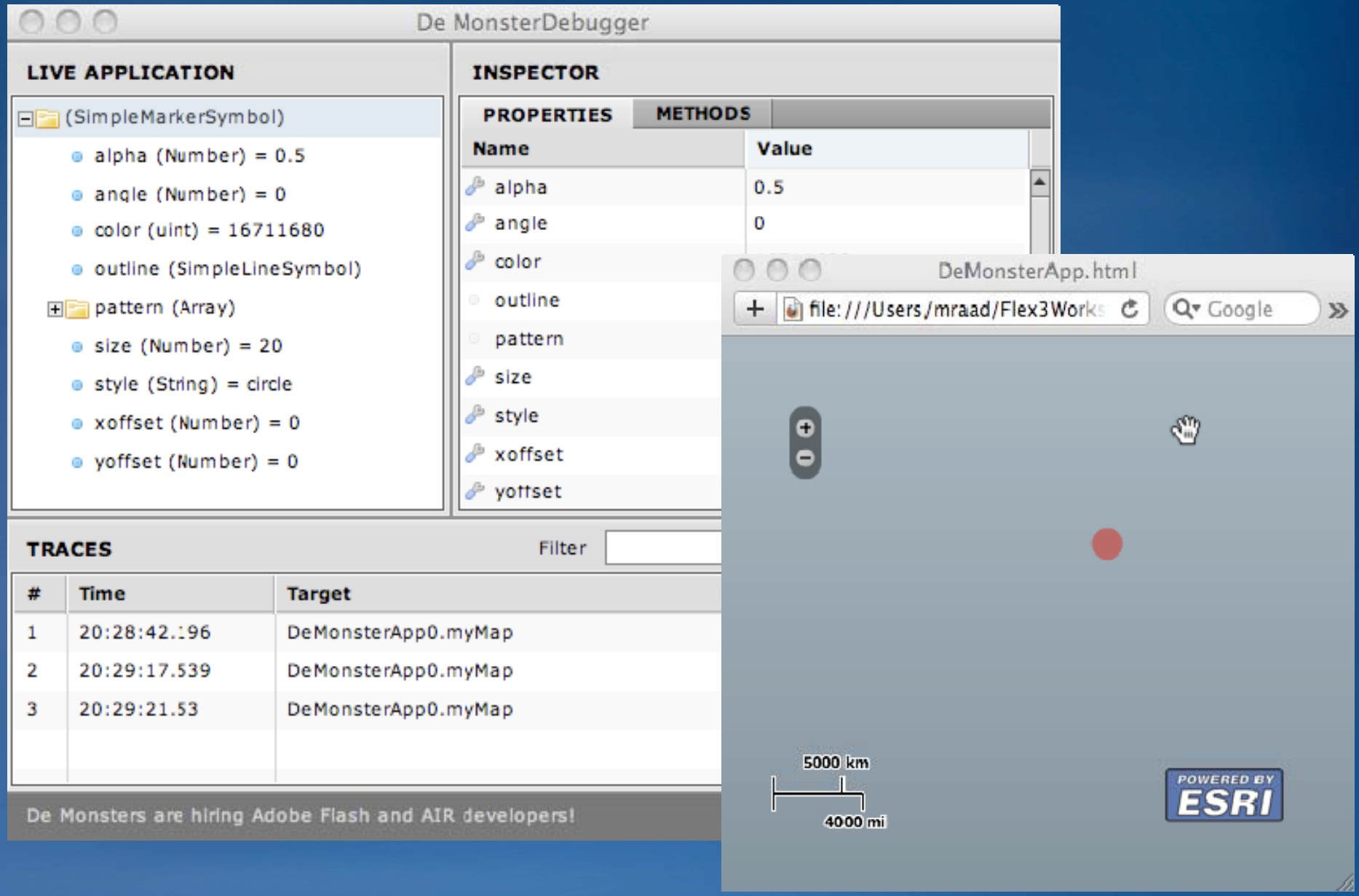
http://www.demonsterdebugger.com/

Debugging

Local Connection



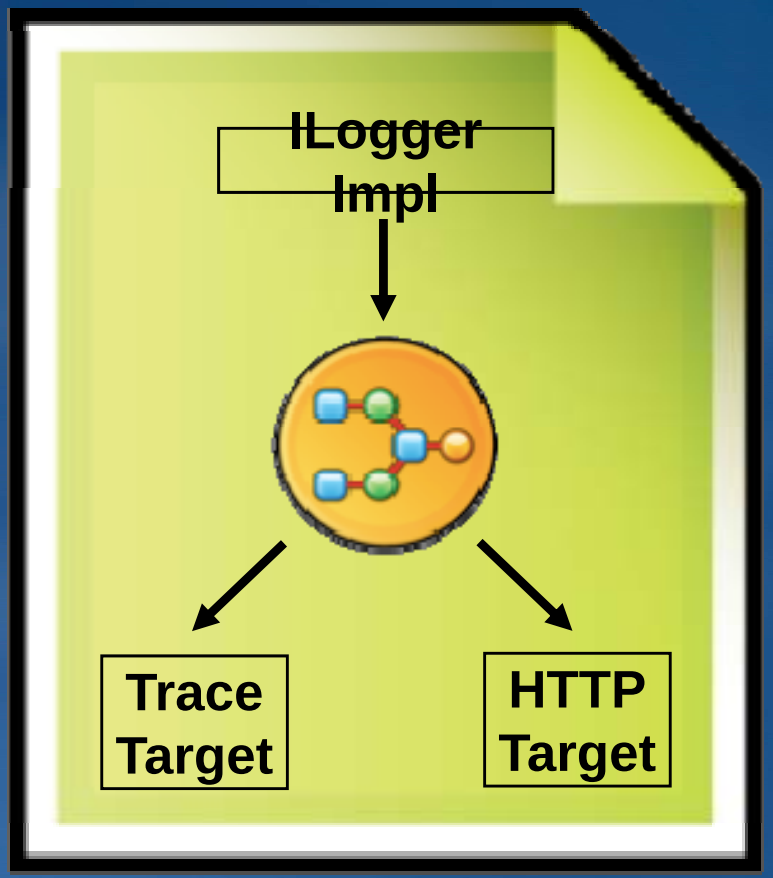
Debugging


De MonsterDebugger
LIVE APPLICATION
(SimpleMarkerSymbol)
alpha (Number) = 0.5
angle (Number) = 0
color (uint) = 16711680
outline (SimpleLineSymbol)
pattern (Array)
size (Number) = 20
style (String) = circle
xoffset (Number) = 0
yoffset (Number) = 0
INSPECTOR
PROPERTIES
METHODS
Name
Value
alpha
0.5
angle
0
color
outline
pattern
size
style
xoffset
yoffset
TRACES
Filter
Time Target
1 20:28:42.196 DeMonsterApp0.myMap
2 20:29:17.539 DeMonsterApp0.myMap
3 20:29:21.53 DeMonsterApp0.myMap
De Monsters are hiring Adobe Flash and AIR developers!
DeMonsterApp.html
file:///Users/mraad/Flex3Work
Google
5000 km
4000 mi
POWERED BY ESRI

Logging

Logging

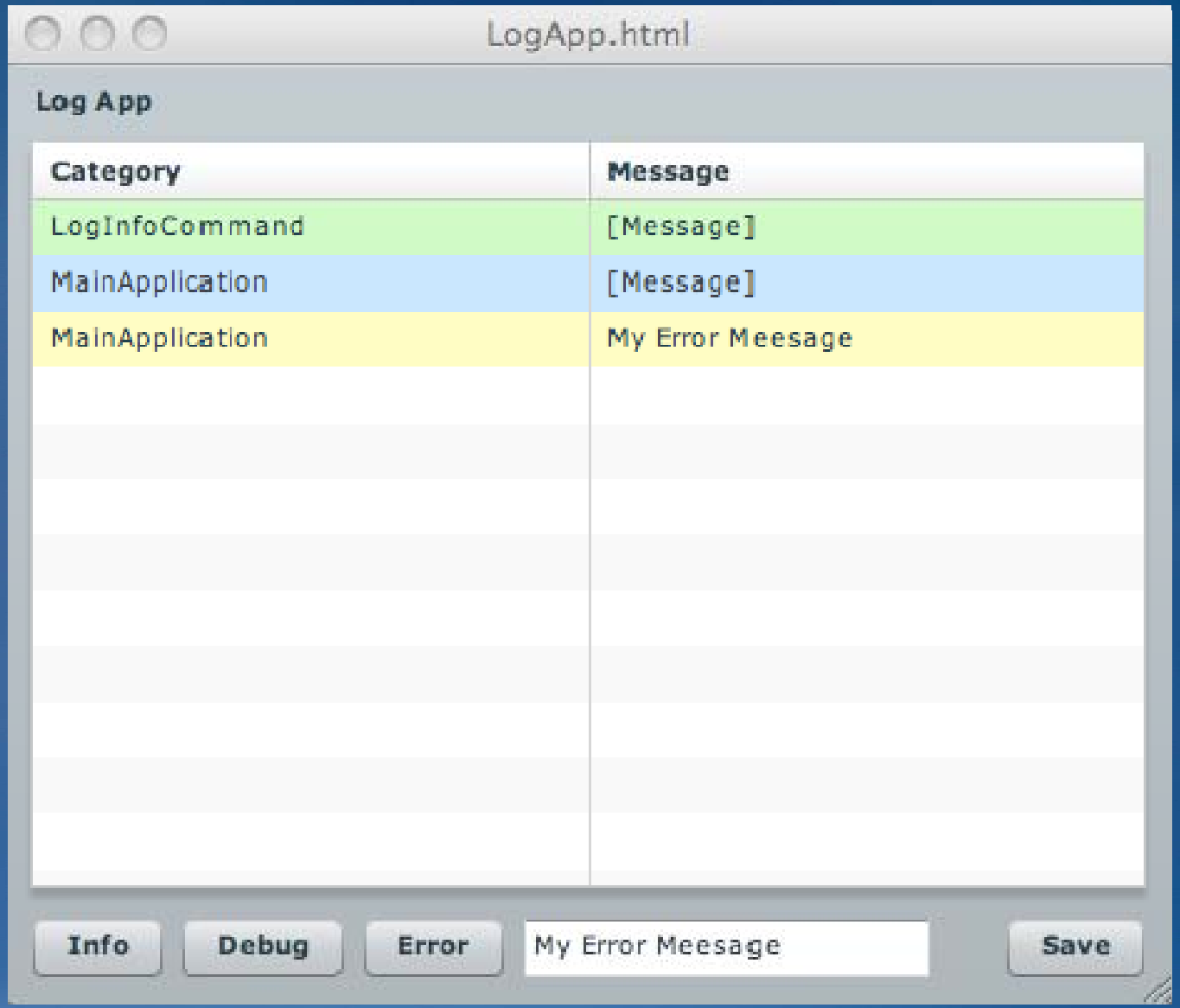
- Log4J
- Log4Net
- ILogger Implementation
- Log Mediator
- Log Target



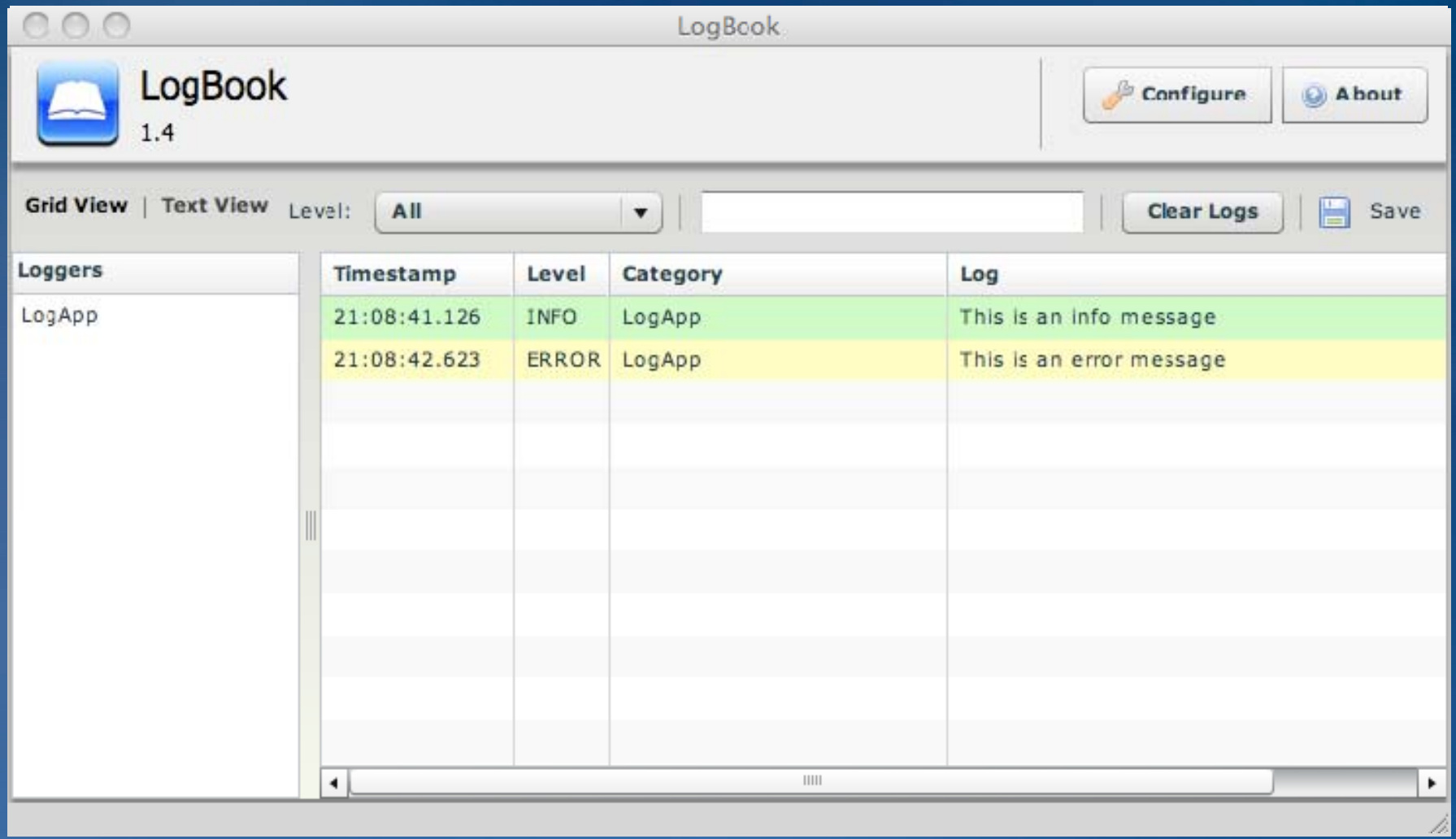
Logging

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <mx:Application xmlns:mx="http://www.adobe.com/2006/mxml" layout="horizontal">
3      <mx:Script>
4          <![CDATA[
5              import mx.logging.ILogger;
6              import mx.logging.Log;
7
8              private var m_logger:ILogger = Log.getLogger("MyLogApp");
9
10             private function logInfo_clickHandler():void
11             {
12                 if (Log.isInfo())
13                 {
14                     m_logger.info("This is an info {0} {1}", "message", 1);
15                 }
16             }
17         ]]>
18     </mx:Script>
19     <mx:TraceTarget/>
20     <mx:Button label="Log Info" click="logInfo_clickHandler()"/>
21 </mx:Application>
```

Logging


LogApp.html
Log App
Category
Message
LogInfoCommand
[Message]
MainApplication
[Message]
MainApplication
My Error Meesage
Info
Debug
Error
My Error Meesage
Save

Logging

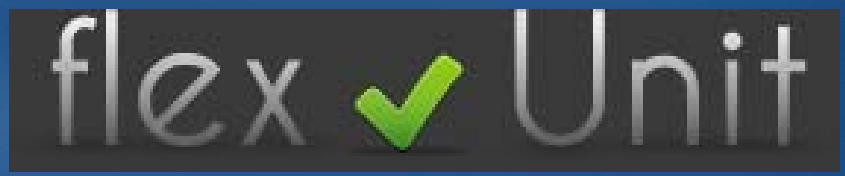


http://code.google.com/p/cimlogbook/

Unit Testing

Testing

- TestMethod
  - Smallest Unit Of Execution
  - Assert Condition At End Of Execution
  - [Test(description=”My Test Description”)]
- Test Case
  - Collection of TestMethods
  - [BeforeClass]
  - [Before]
  - [Test]
  - [After]
  - [AfterClass]
- Test Suite
  - Collection of Test Cases and or Suites
  - [Suite]



http://www.flexunit.org

Testing

```
[Test]
Public function addition():void {
  Assert.assertEquals(12,simpleMath.add(7,5));
}

[Test]
Public function subtraction():void {
  Assert.assertEquals(9,simpleMath.subtract(23,3));
}
```

Testing

[BeforeClass]

```
Public static function runBeforeClass():void {
  //run for one time before all test cases
}
```

[AfterClass]

```
Public static function runAfterClass():void {
  //run one time after all test cases
}
```

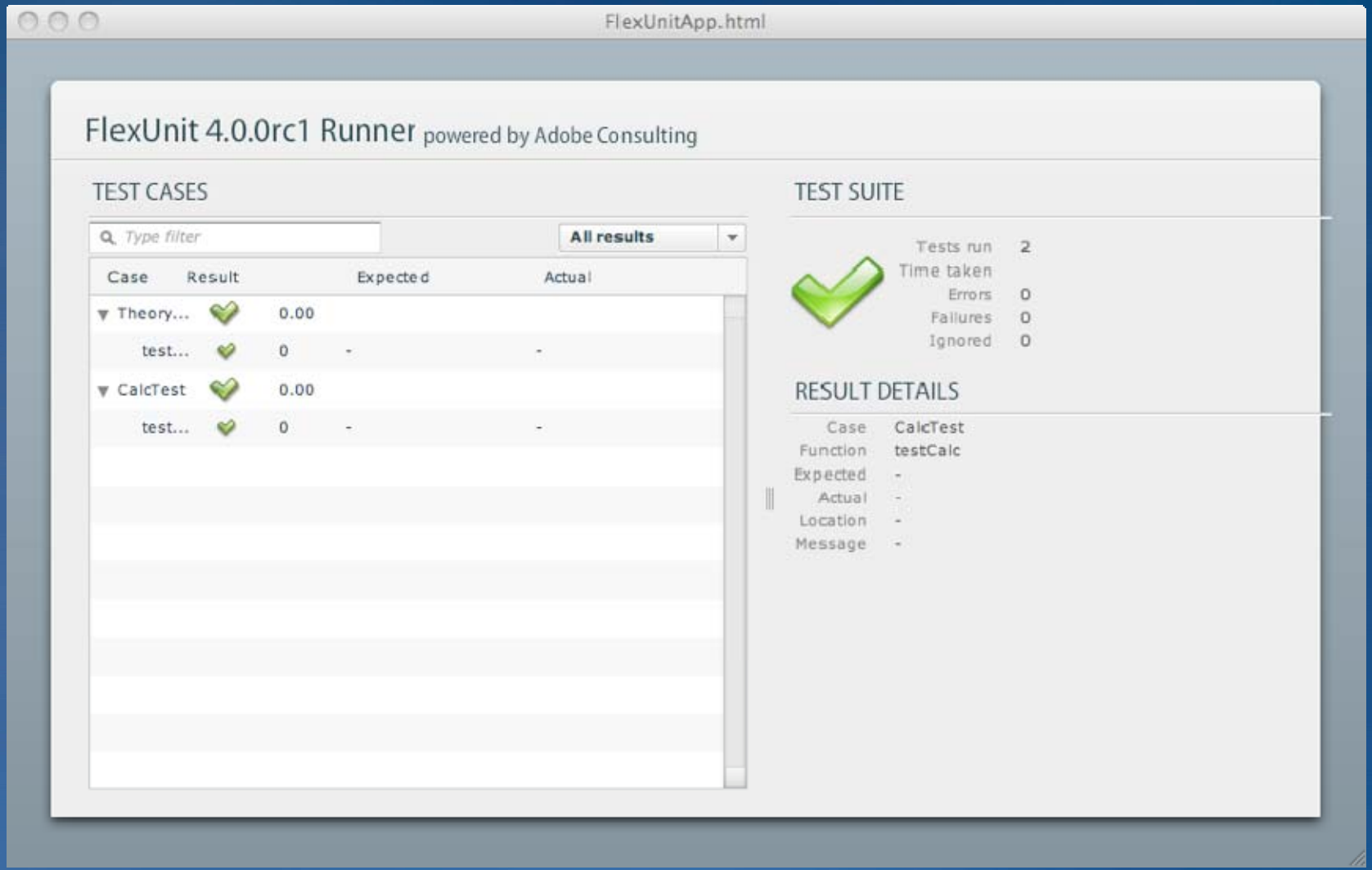
Testing

```
[Suite]
[RunWith("org.flexunit.runners.Suite")]
Public class MySuite {
  public var t1:BasicMathTest;
  public var t2:MyTheory;
}
```

Testing

```
[DataPoints]
[ArrayElementType("String")]
public static var stringValues:Array = ["one","two","three","four","five"];

[DataPoint]
public static var values1:int = 2;
[DataPoint]
public static var values2:int = 4;

[DataPoints]
[ArrayElementType("int")]
public static function provideData():Array {
        return [-10, 0, 2, 4, 8, 16 ];
}

[Theory]
public function testDivideMultiply( value1:int, value2:int ):void {
    assumeThat( value2, greaterThan( 0 ) );
    var div:Number = simpleMath.divide( value1, value2 );
    var mul:Number = simpleMath.multiply( div, value2 );
    Assert.assertEquals( mul, value1 );
}

[Theory]
public function testStringIntCombo( value:int, stringValue:String ):void {
        //call some method and do something
}
```

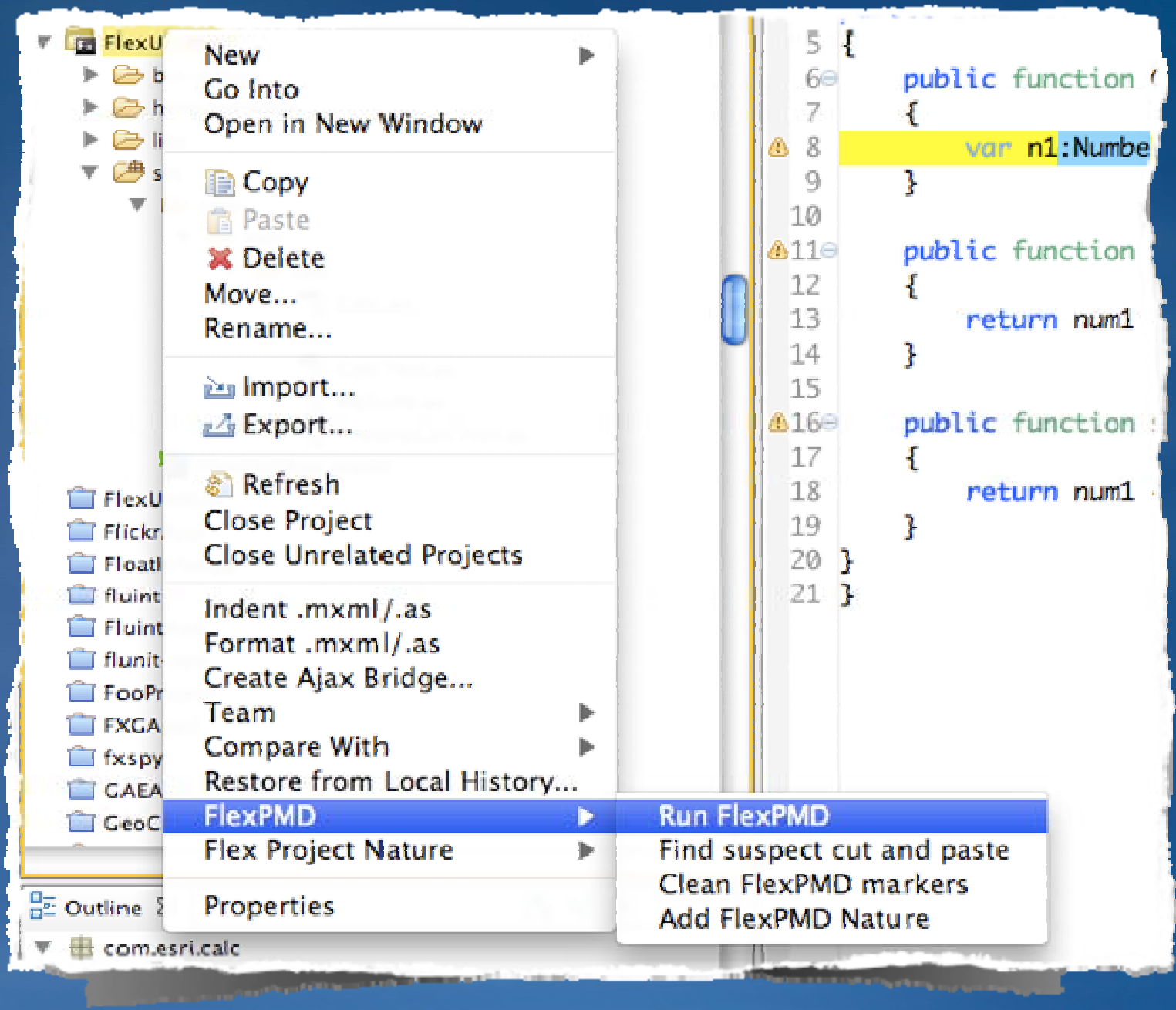
Testing


FlexUnitApp.html
FlexUnit 4.0.0rc1 Runner powered by Adobe Consulting
TEST CASES
Type filter
All results
Case
Result
Expected
Actual
Theory...
0.00
test...
0
-
-
CalcTest
0.00
test...
0
-
-
TEST SUITE
Tests run
2
Time taken
Errors
0
Failures
0
Ignored
0
RESULT DETAILS
Case
CalcTest
Function
testCalc
Expected
-
Actual
-
Location
-
Message
-

Testing - “Programming Mistake Detector”

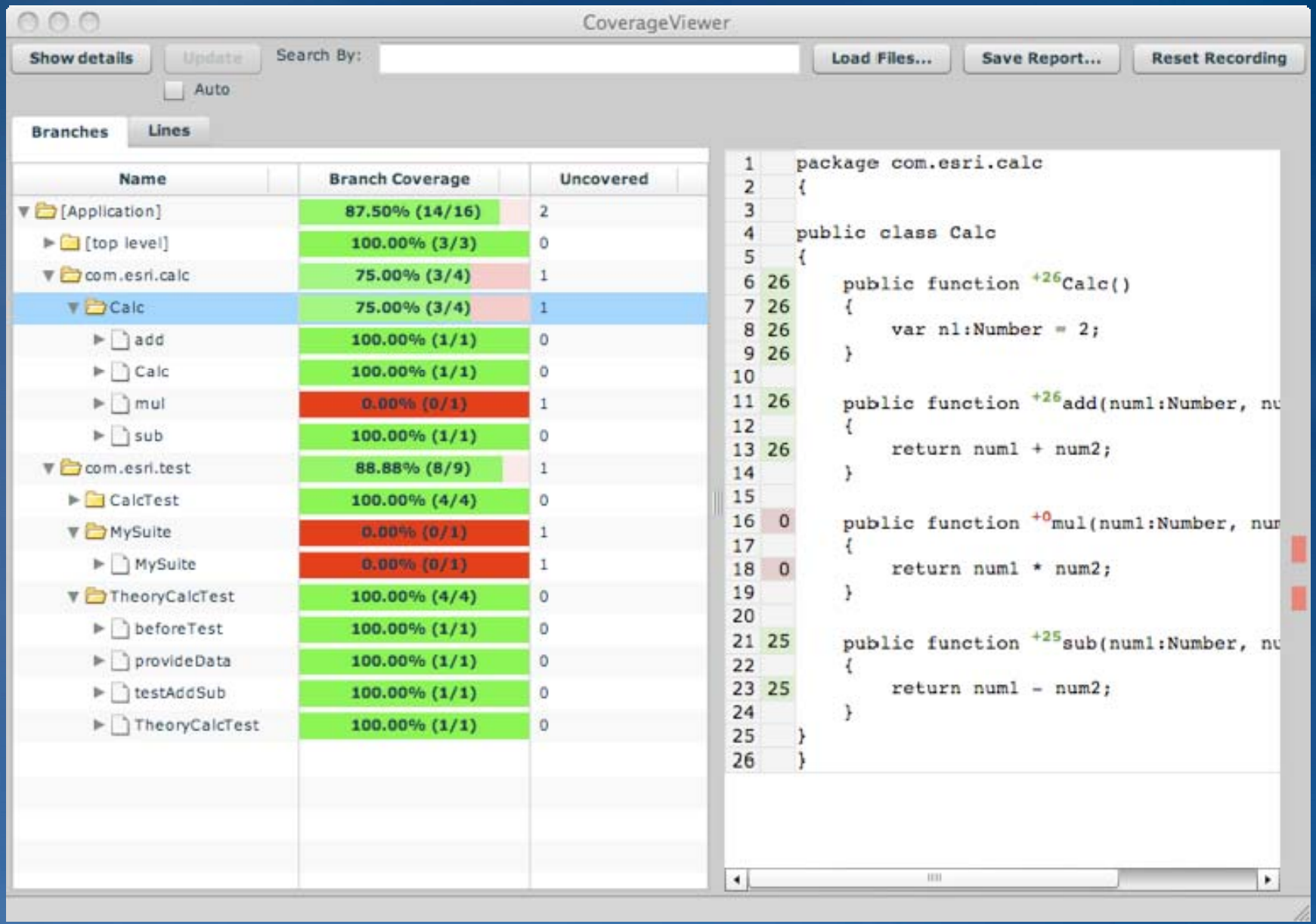
- Possible Bugs
  - empty try/catch
- Dead Code
  - unused variables
- Suboptimal Code
  - heavy constructor
- Overcomplicated Expressions
  - nested loops
- Duplicated Code
  - copy & paste

Testing - “Programming Mistake Detector”

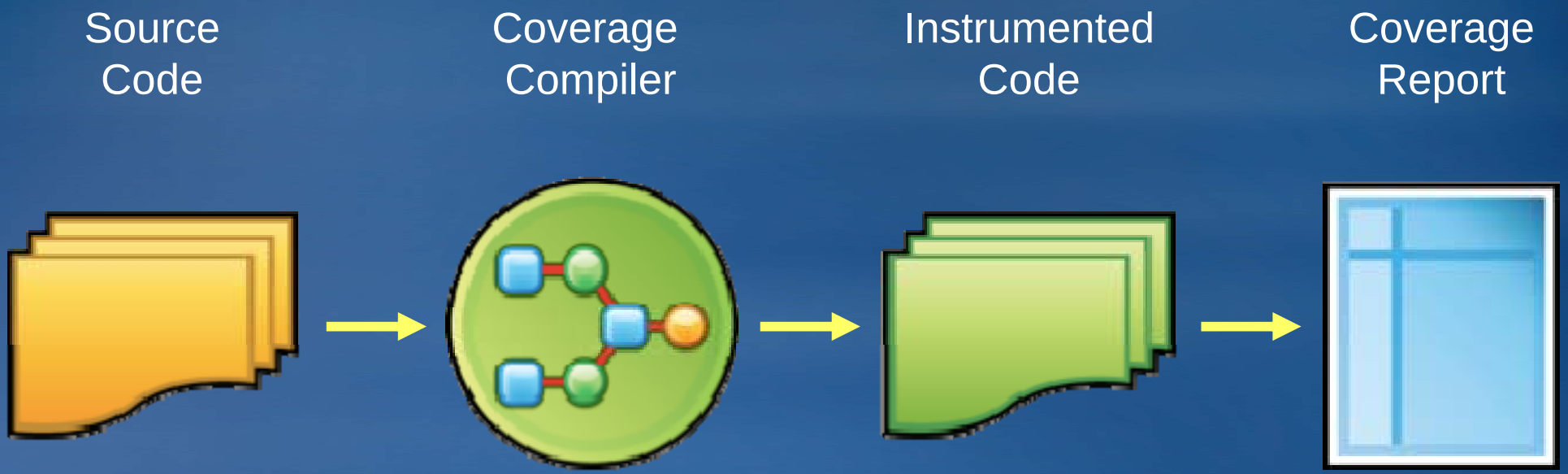


Code Coverage

Code Coverage



Code Coverage

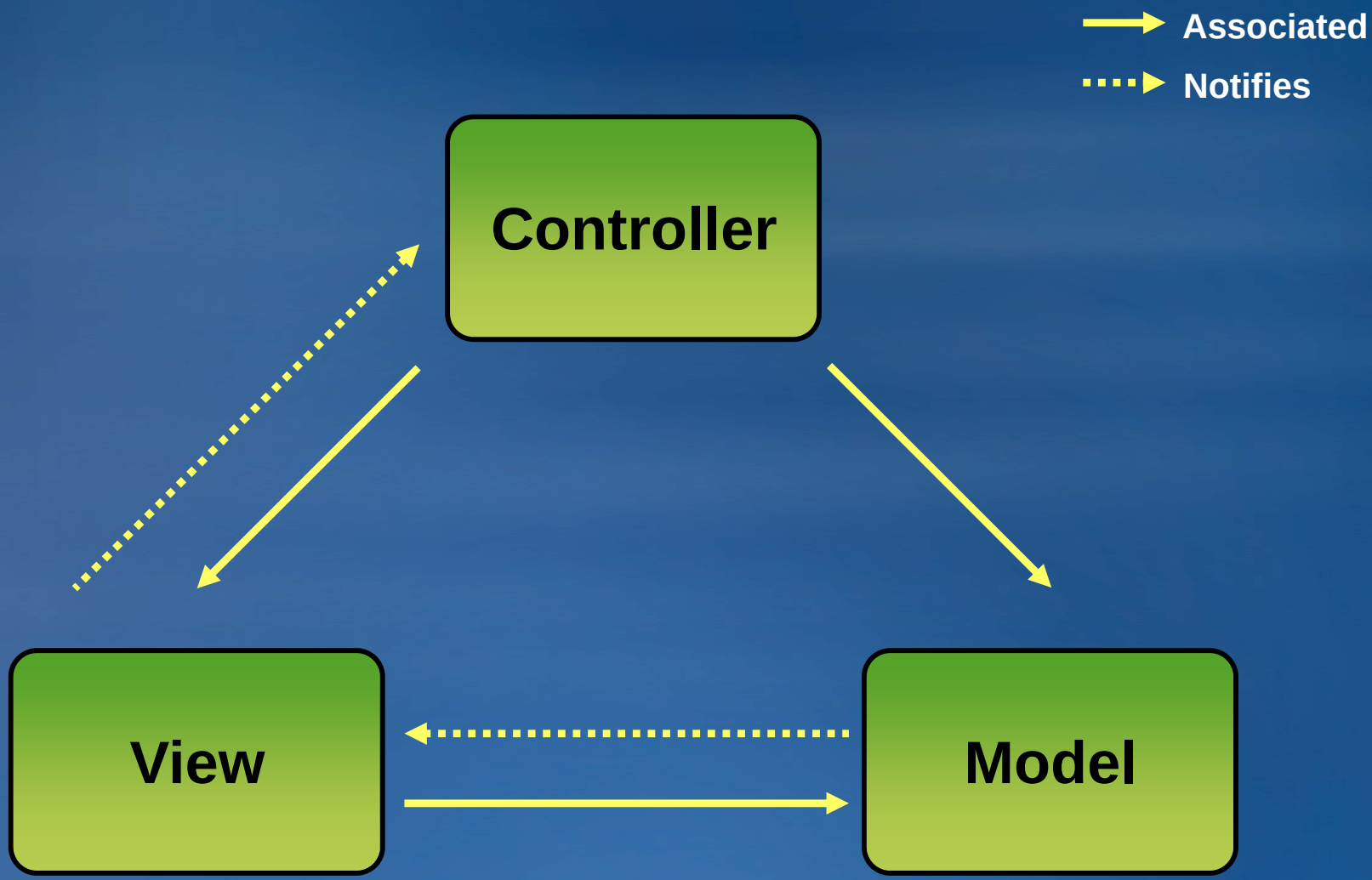


Frameworks

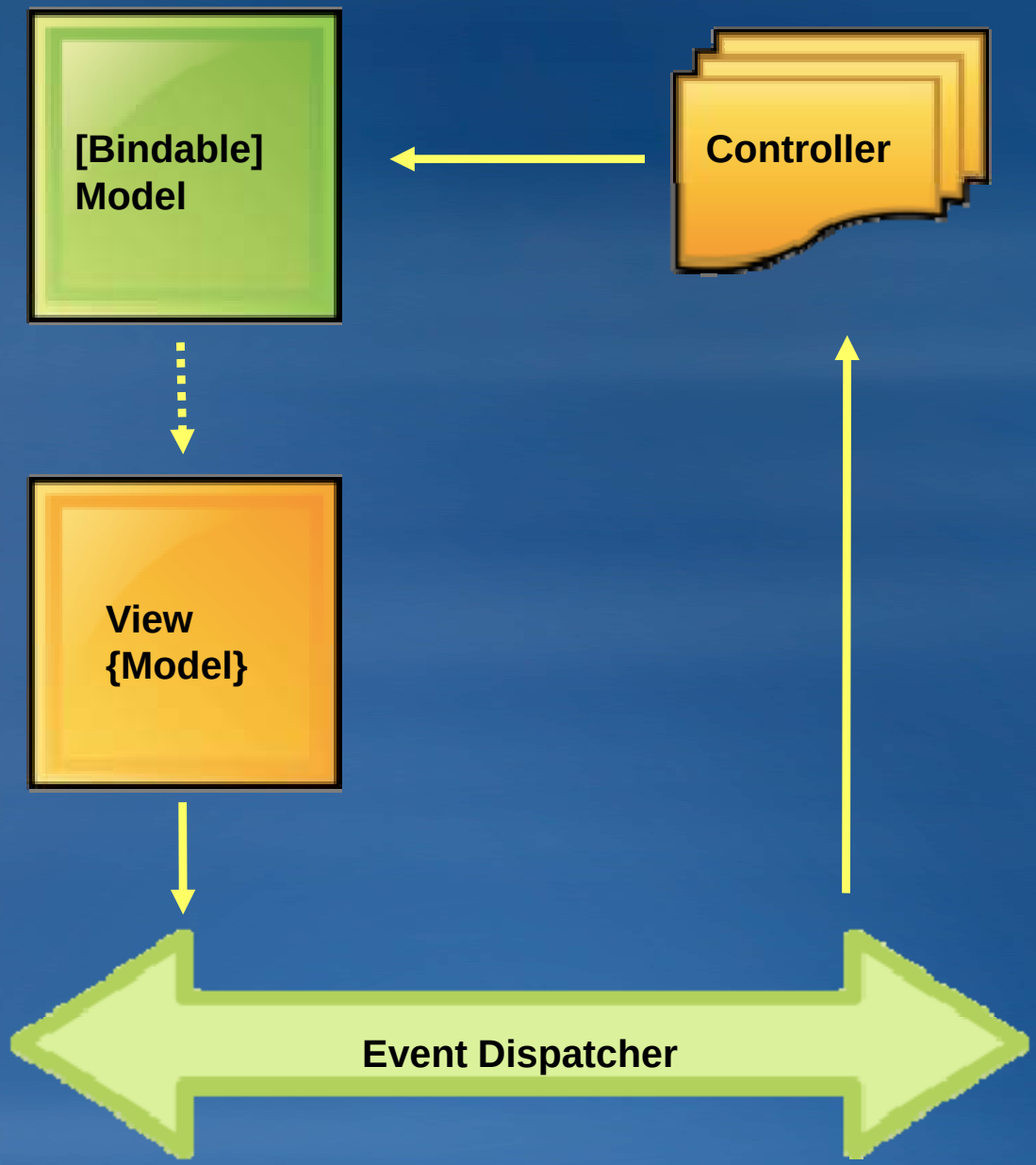
Lots Of Frameworks

- Cairngorm
- PureMVC
- Swiz
- Robotleg
- SpringActionScript
- Mate
- Your Own

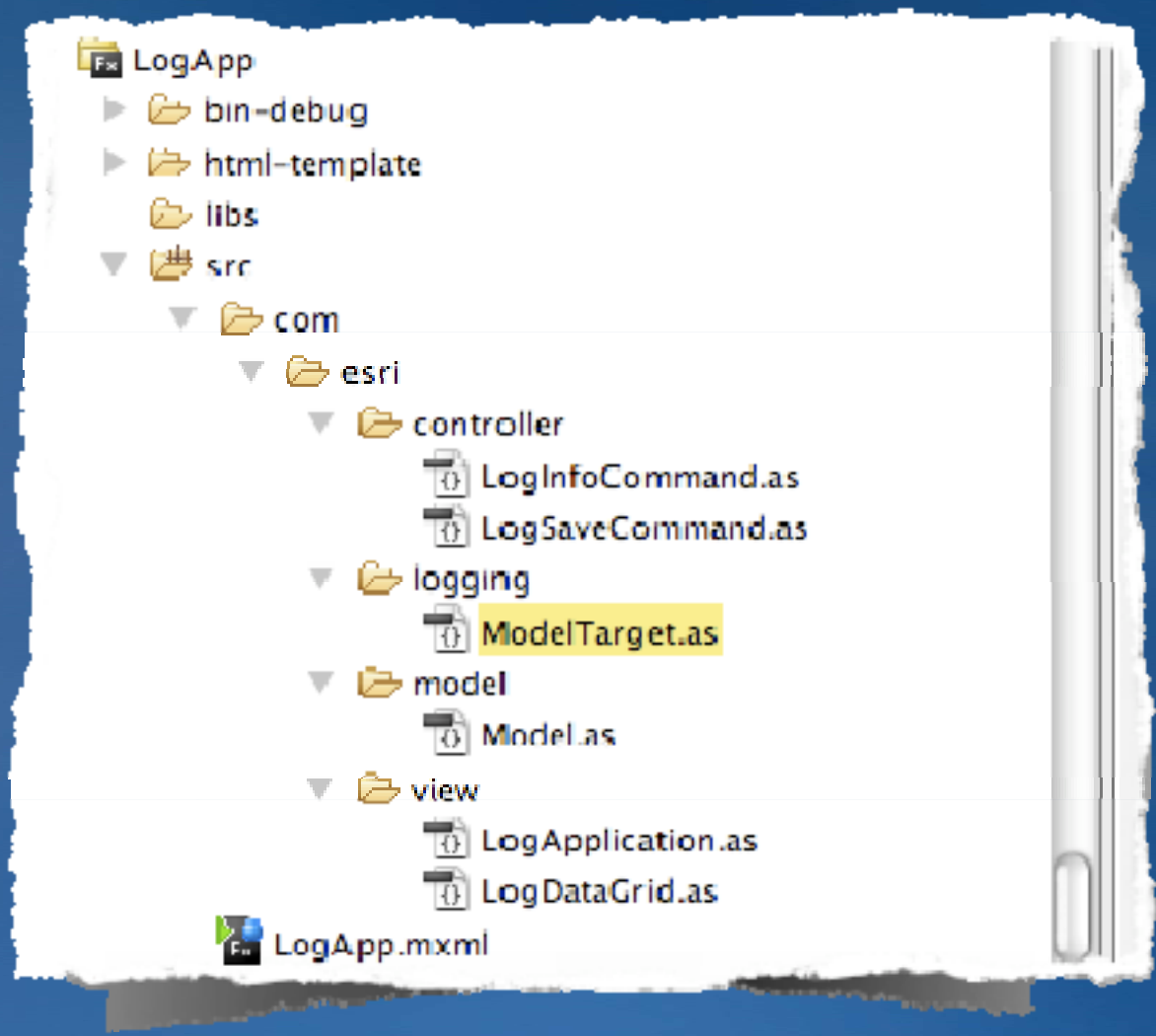
Model View Controller



Model View Controller



Model View Controller



Questions