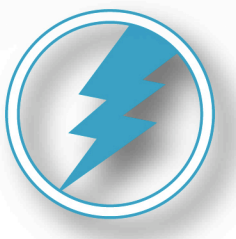

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A ColdFusion, Flex & AIR Conference

Intro to Flex Debugging and Profiling

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RealEyes Media

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www.cfunited.com

About

A. Sr. Developer / Technical Trainer at RealEyes Media, LLC
B. Flex (2-4) and AIR (0.x, 1.x) Developer from the ColdFusion (4-7) World
C. Seminar Speaker (CFUnited, 360|Flex, MAX,etc.)
D. Published Author (Professional Adobe Flex 3, InsideRIA, Flex/Fusion Authority)

Overview

A. Level 100
   - You're new to Flex development.
   - You want a good overview of the Flex debugging and profiling landscape.

B. What we'll cover
   - General Concepts
   - Debugging and Profiling: ActionScript and MXML
   - Debugging and Profiling: Flash Builder 4
   - Third Party Tools

C. The Goal
   - You should have a good understanding of the tools available to you for debugging and profiling your Flex applications.

Quick Note

A. Although I can talk quickly I will not read these slides verbatim.
   - We have a good 30 slides of content or so.
   - I will give you a 30-60 second overview of what each one means, and you can download them for reference later.
   - I want to save about 5-10 minutes for questions at the end and most importantly ample time for demonstration.
   - That being said we will most likely defer longer questions to the end or one-on-one time during the remainder of the conference.
   - I am always open to hearing from you and love to help, so don't be shy after this session is over if you'd like more info.

General Concepts

Information is Good

A. Before Debugging or Profiling analyze information at hand.

- Feedback from testers, end-users, or your own testing:
  a) Specific actions being performed in the application
  b) Specific data being loaded into the application
- Runtime environment
  a) Specific software (OS, Browser, Flash Player or AIR)
  b) Specific versions of software

Chaos is Bad

A. Use a structured and systematic approach when you debug and profile:
   - When changing code, try to make one change at a time
   - Each testing iteration should be as identical as possible
   - When you think you have a solution, make sure to test it several times (Especially when performance tuning)

Money Rules All

A. When debugging and profiling keep in mind:
   - Someone is paying for each minute you spend troubleshooting/ optimizing
   - There will be a point of diminishing returns
   - There is a chance that what you notice as unacceptable is actually perfectly acceptable to the majority of stakeholders

Debugging and Profiling: ActionScript and MXML

trace()

A. Been around forever. Used to send information to console output.
B. Often paired with mx.utils.ObjectUtil.toString()

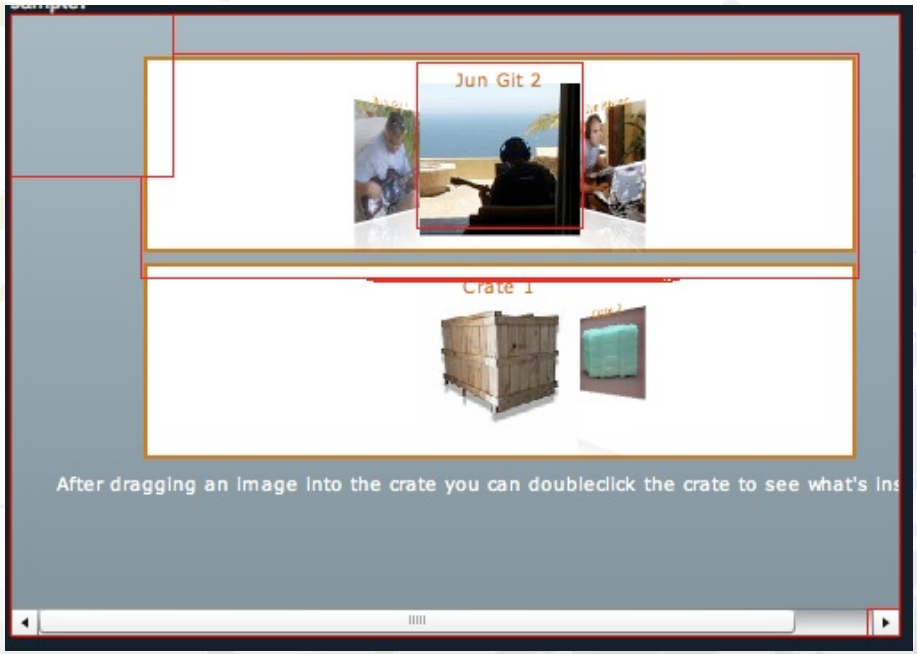
```
trace( ObjectUtil.toString( this ) );
```

flash.system.*

A. This package contains both System and Capabilities:
   - flash.system.Capabilities
     a) Contains useful system information
        - Know if the player is debug version
        - Know what operating system the app is running on
        - Many others
   - flash.system.System
     a) Contains a couple useful debugging tools
        - System.totalMemory - player-wide
        - System.gc() - For Flash Player, debugger only. For AIR, everything in the ADL or content in the application security sandbox for an installed application

flash.profiler.*

A. One method in this package. Used with the debugger version of the Flash Player: flash.profiler.showRedrawRegions()
   - Used to show what portions of the screen are being redrawn and when.



mx.logging.*

A. Several packages make up the Flex Logging Framework:
   - mx.logging.*
   - mx.logging.errors.*
   - mx.logging.targets.*
B. Used to log information throughout the life of your application
C. Customizable
D. In MXML Declaration Block <mx:TraceTarget/>

flash.sampler.*

A. This package contains methods and classes used by the Flash Builder Profiler
B. You can utilize these methods and classes with a custom profiling application running in Flash debugger player version 9.0.115.0 or above.

Demonstration: Utilizing MXML and ActionScript constructs

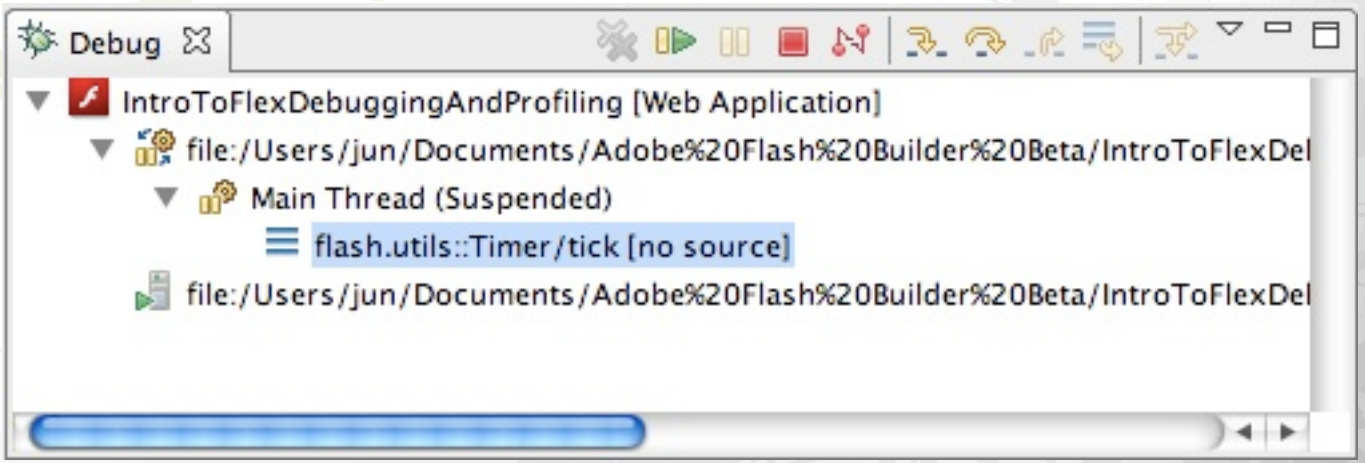
Debugging: Flash Builder 4

Flash Debug Perspective

A. A Flash Builder perspective that has been optimized for running applications in debug mode. Various debug specific views:
   - Debug
   - Variables
   - Breakpoints
   - Expressions
   - Console
   - Network Monitor (New to FB4)

Debug View

A. Used to display active debugging sessions
   - Start/Pause/Stop sessions
   - Step Debugger (Step Into/Over/Return)
   - When breakpoints are hit will display call stack



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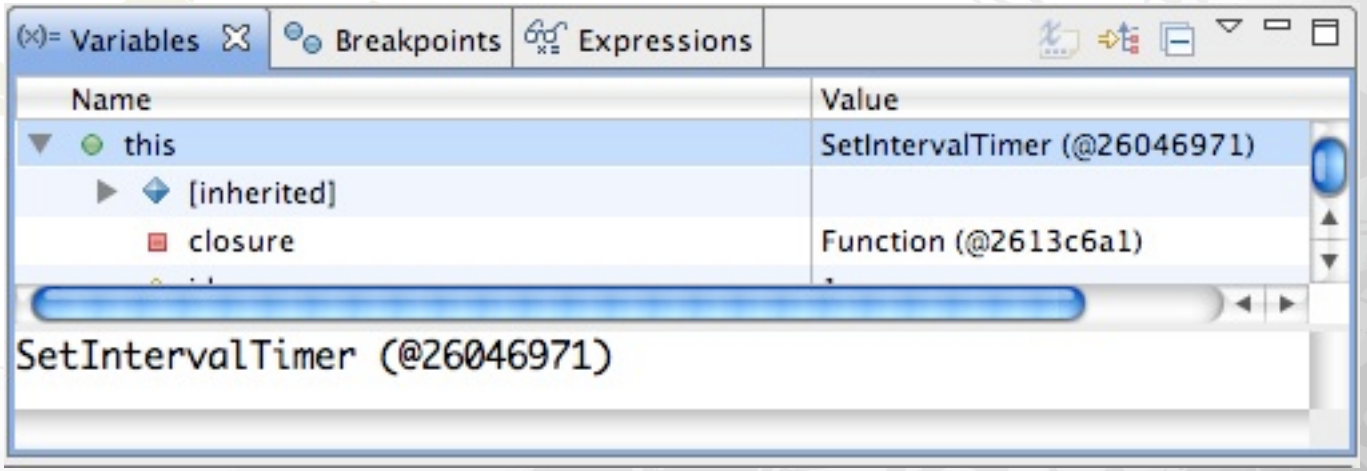
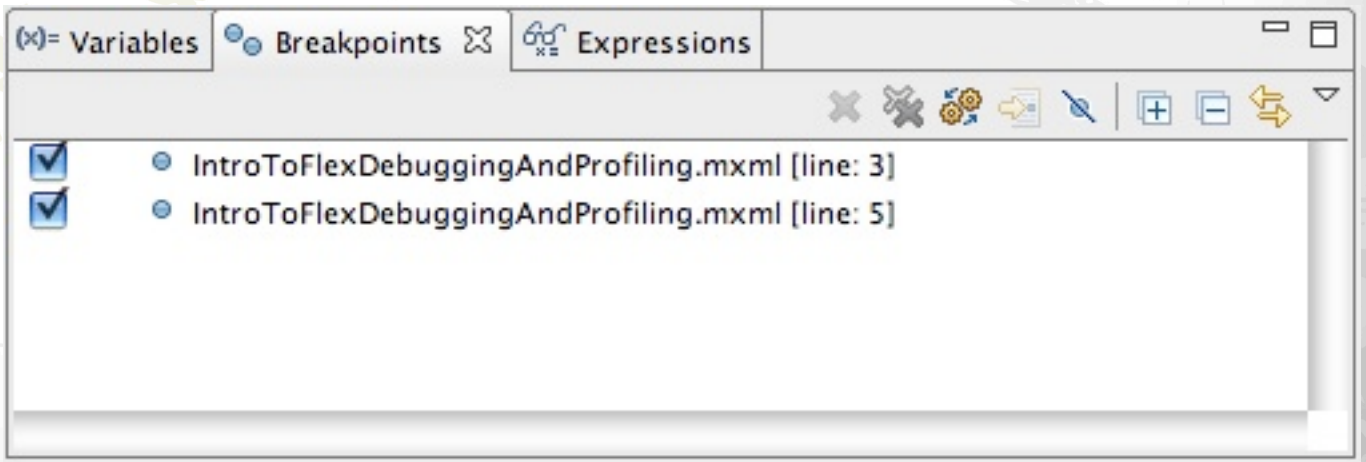
Variables View

A. Used to display variable state information while a debugging session is suspended
B. If there are multiple items in a call stack you will see different variable state for each call stack item
C. Toggle Watchpoints on instances (New to FB4)



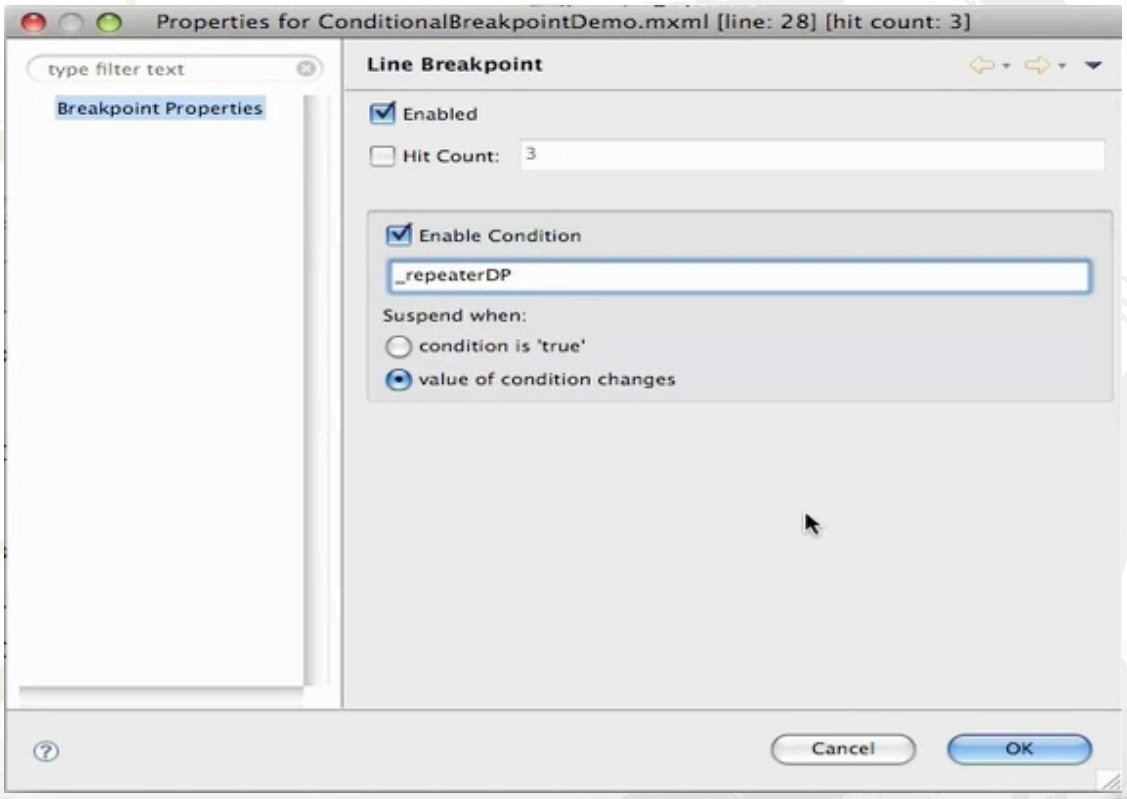
Breakpoints View

A. List and access all the breakpoints that have been set in the active workspace code.
   - Navigate to the code where the breakpoint was set
   - Import and export breakpoints
   - Modify breakpoint properties (Conditional Breakpoints - New to FB4)



Conditional Breakpoints

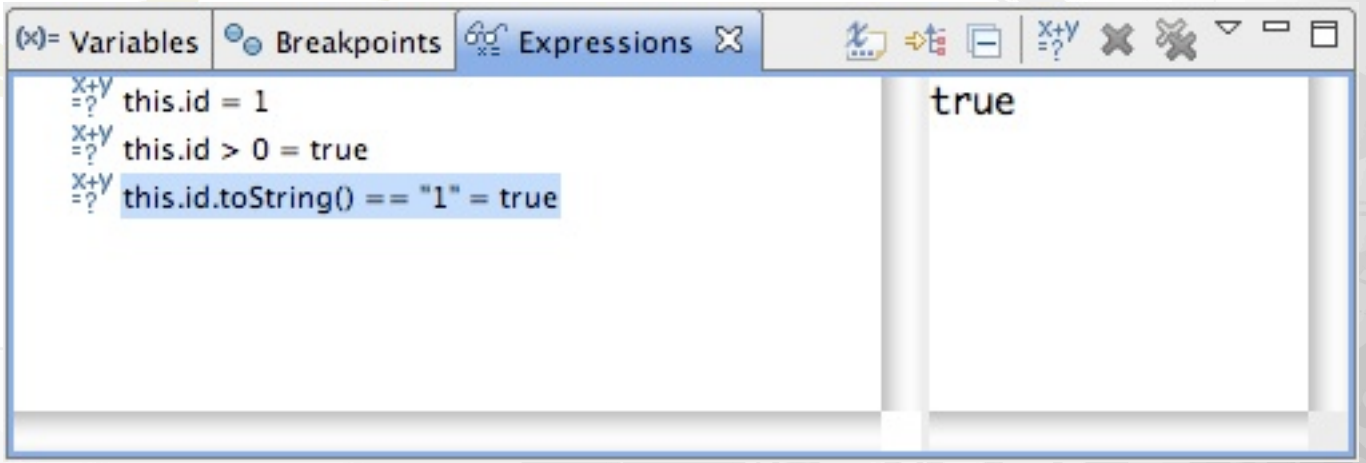
A. Used to decide when a breakpoint should suspend an application. (New to FB4)



Expressions View

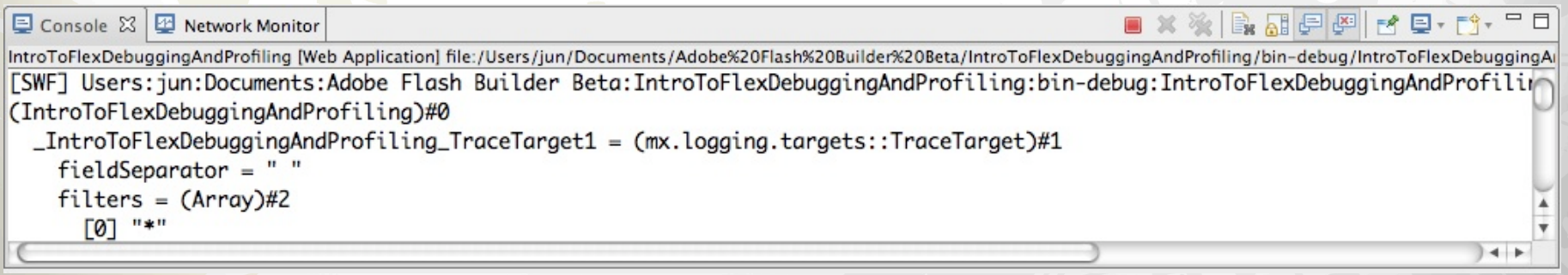
A. Useful place to watch very specific variables rather than having to continually locate them in the Variables view.

B. A place to set expressions that you would like to see the status of when particular breakpoints are hit



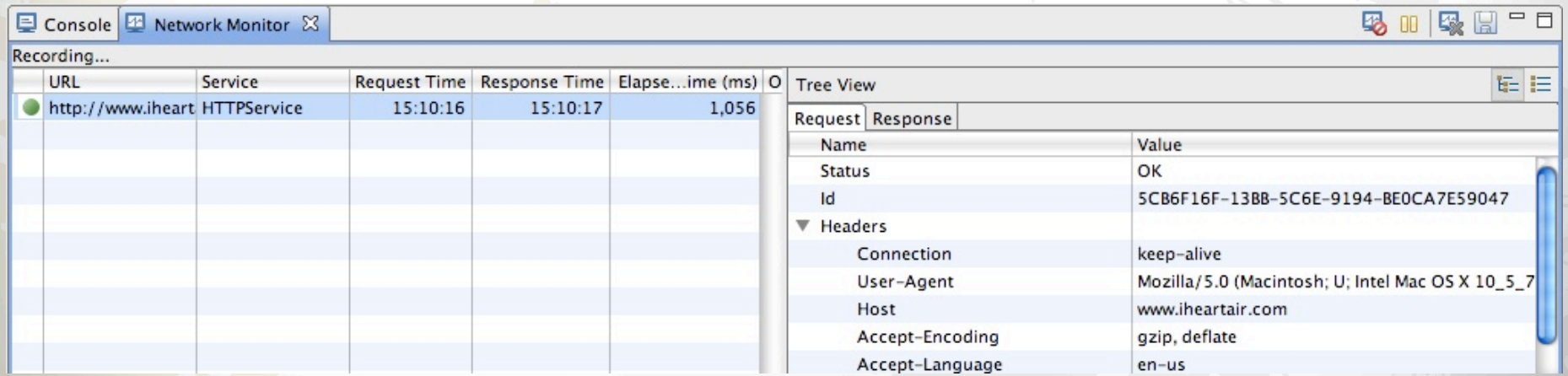
Console View

A. Used to display console output
B. If you do a trace() it will show up here



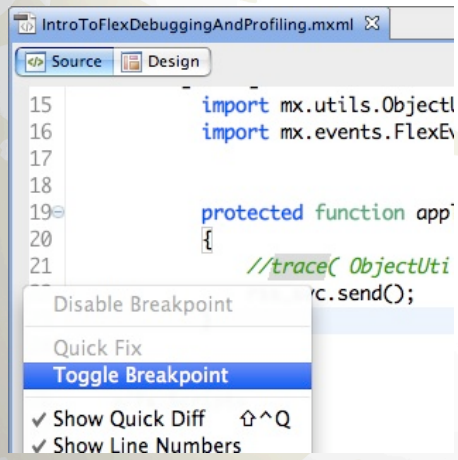
Network Monitor View

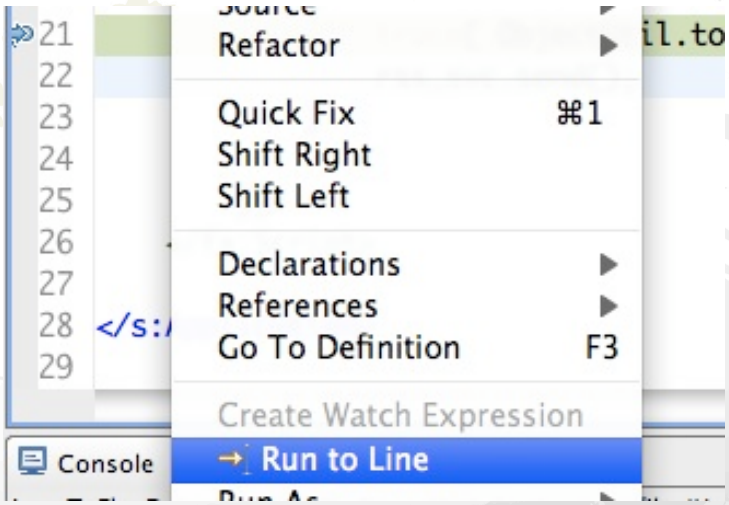
A. New to FB4
B. It can be used with Flex 4 and Flex 3.4 project

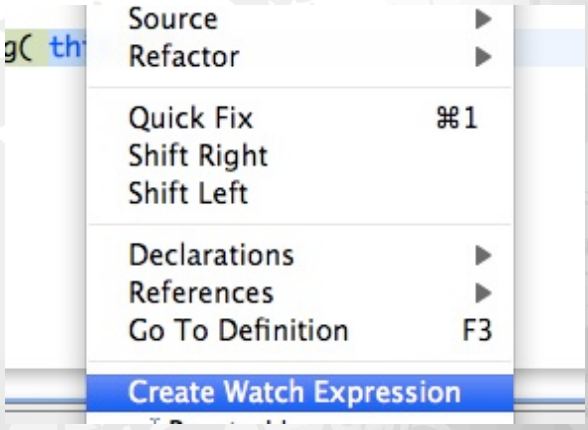


Code Editor Tips

A. Enable/disable and add/remove breakpoints
B. Right-click to create a watch expression
C. When suspended during a debug session:
   - mouse over to see tool tip information on variables
   - select a line of code and use “Run to Line” - New to FB4





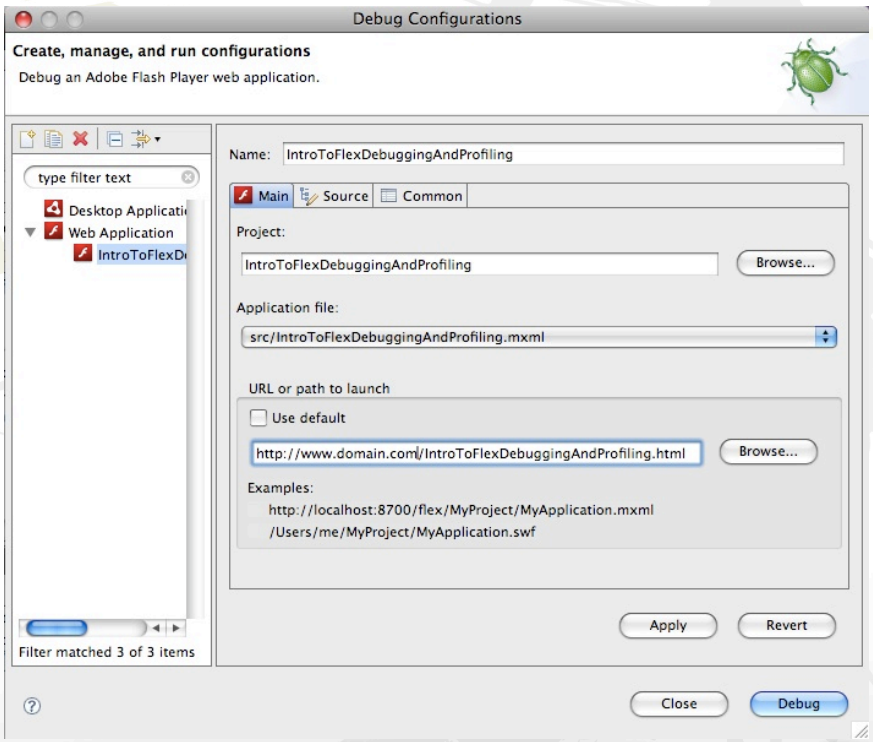


Demonstration: Debugging with Flash Builder

Debugging Tip - Launching

A. You can launch an external application for debug (make sure it's compiled with debug information):

- Run menu --> Debug --> Other... --> Select your Debug Configuration



Profiling: Flash Builder 4

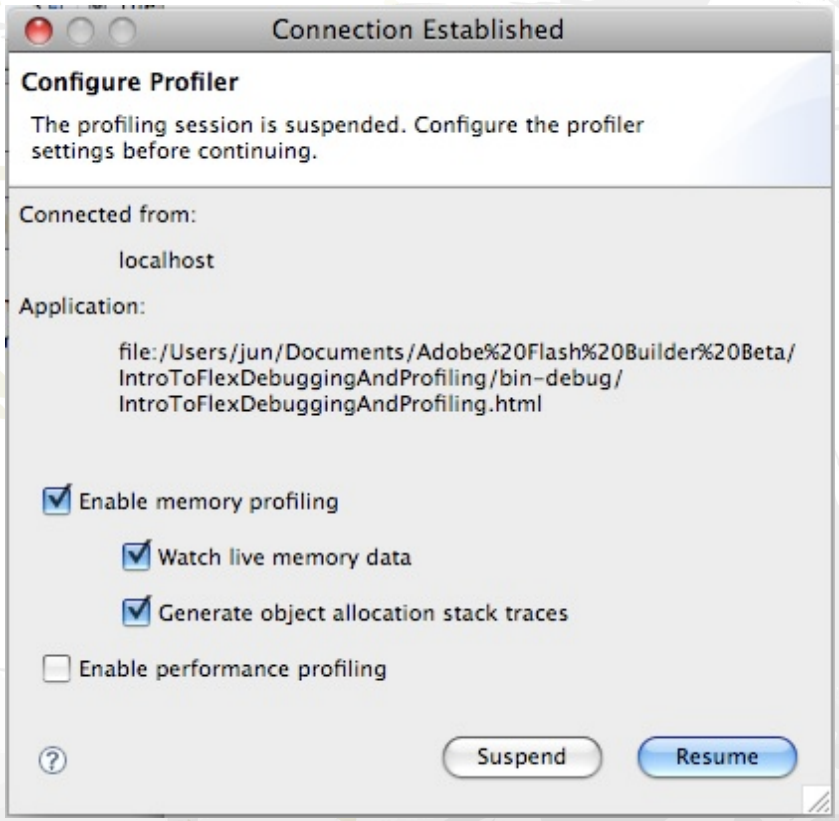
Flash Profile Perspective

A. A Flash Builder perspective that was optimized for profiling your applications.
B. Used to Memory profile and Performance profile
C. The views available:

- Profile
- Saved Profiling Data
- Console
- Allocation Trace
- Live Objects
- Loitering Objects
- Memory Snapshot
- Memory Usage
- Method Statistics
- Object References
- Object Statistics
- Performance Profile

Launching a Session

A. When you launch a profiling session, you are given a choice of what type of data you want the profiler to collect

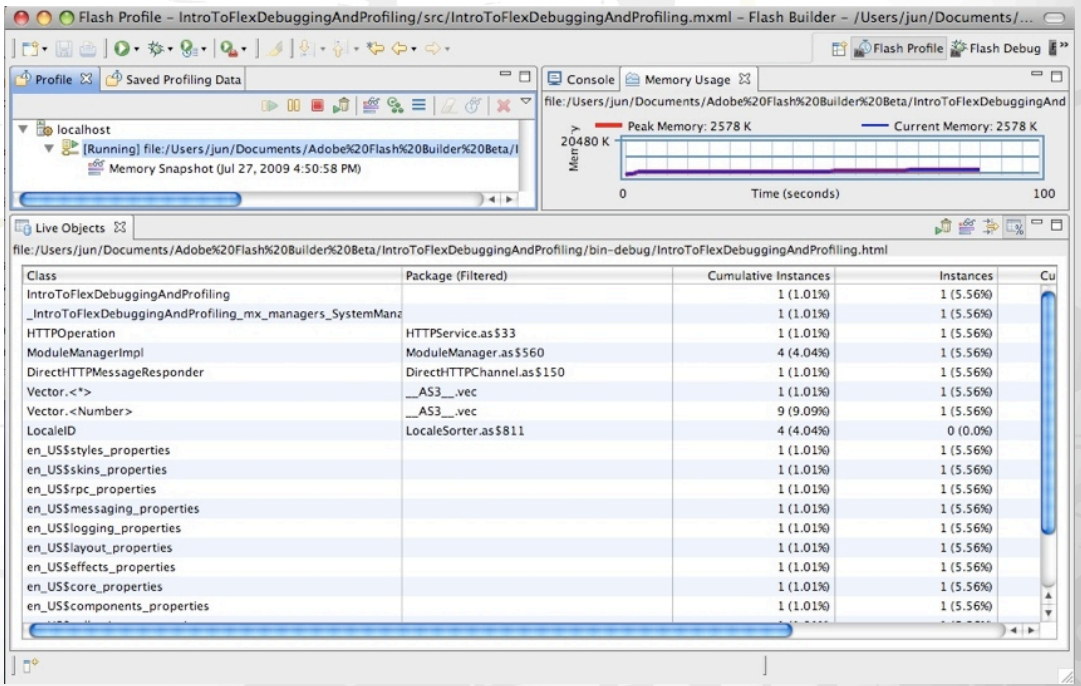


Memory Profiling

A. Used to get memory footprint information and debug issues with memory leaks or excessive instance allocation.

B. Important views:

- Memory Usage
- Live Objects
- Memory Snapshot
- Object References
- Loitering Objects
- Allocation Trace



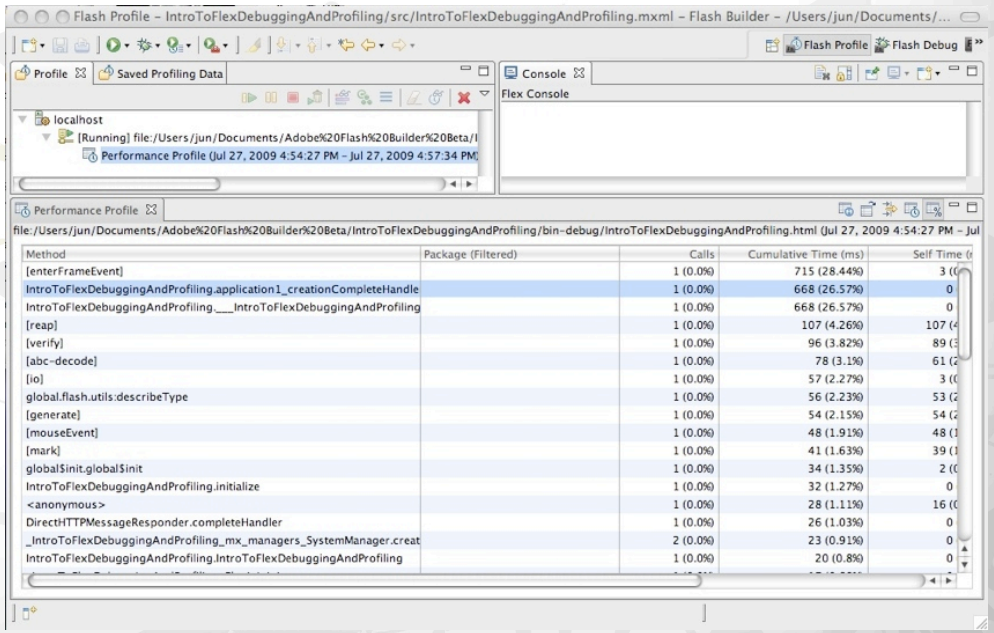
Demonstration: Memory Profiling

Performance Profiling

A. Used to find performance bottlenecks: long running methods or excessively called methods.

B. Can be used to compare the performance differences between similar algorithms (for vs. for each)

C. Important views:
   - Performance Profile
   - Method Statistics

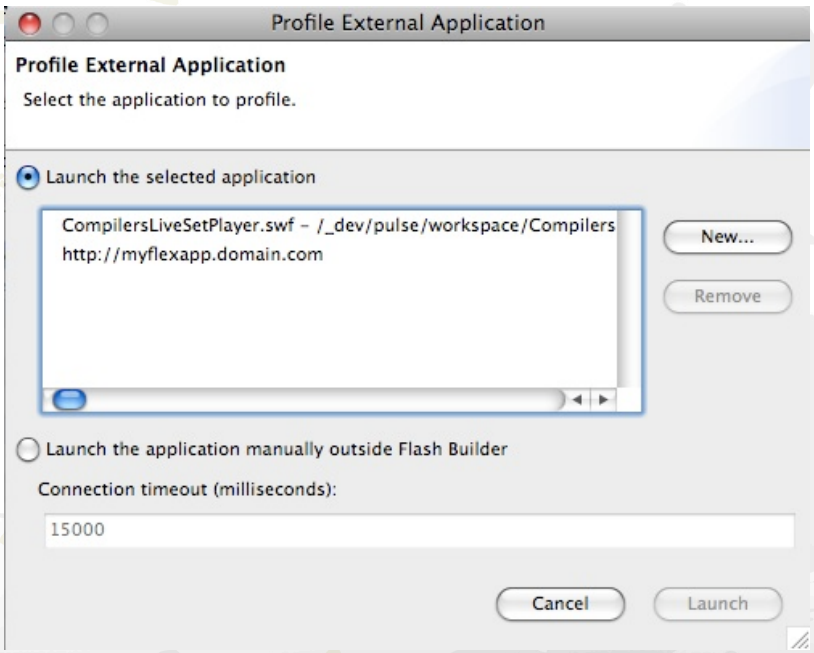


Demonstration: Performance Profiling

Profiling Tip - Launching

A. If you're in the Flash Profile perspective you can launch an external application (make sure it's compiled with debug information):

- Profile menu --> Profile External Application



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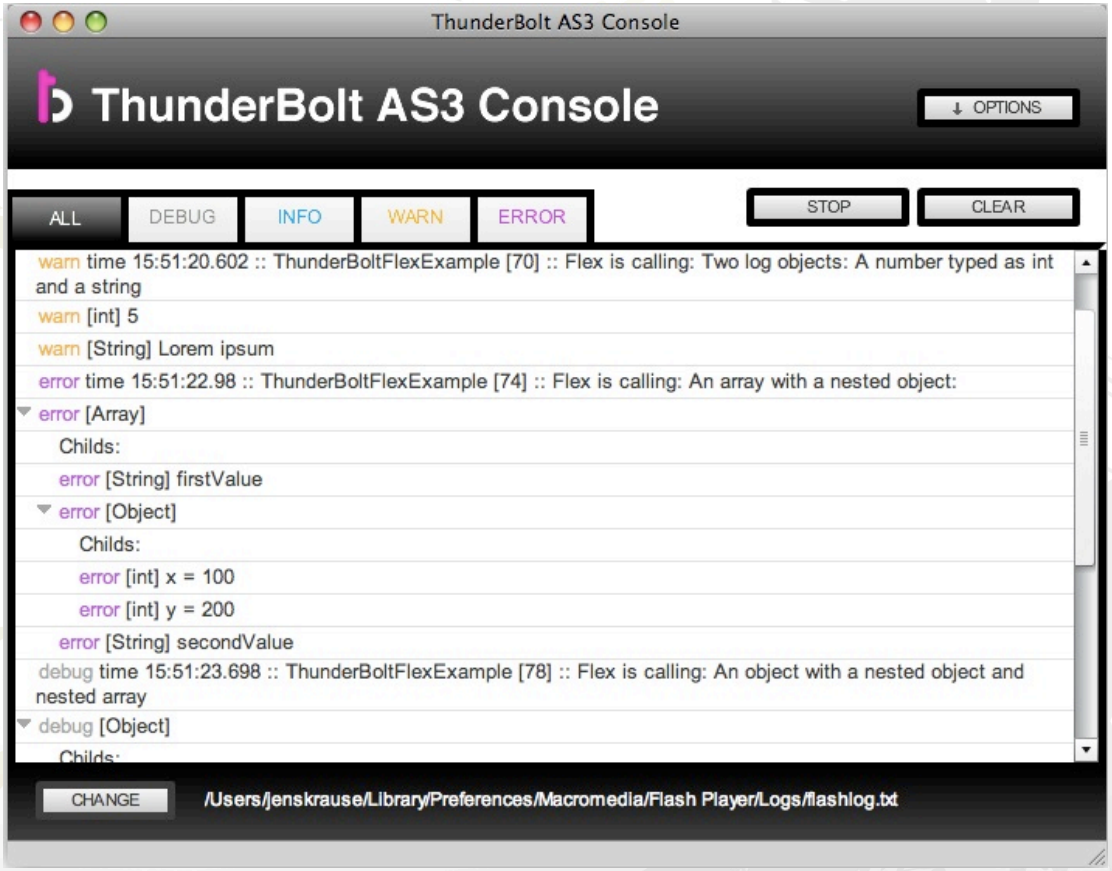
Third Party Tools

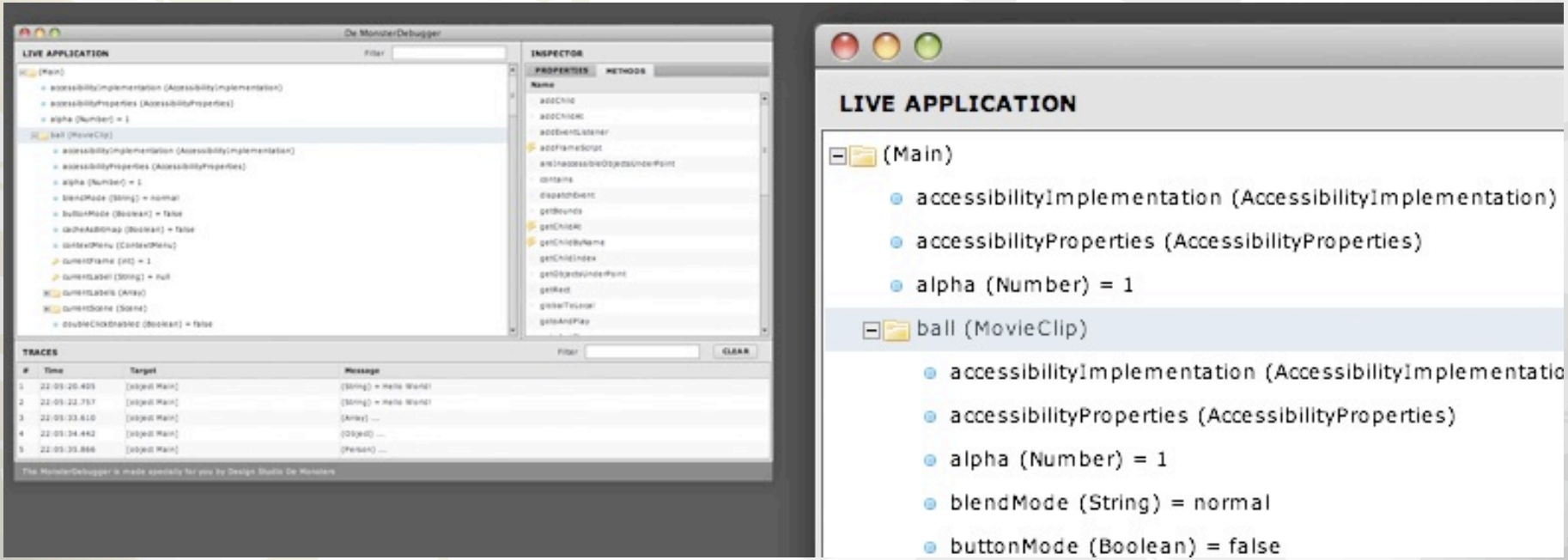
ThunderBolt

Great logging tool.



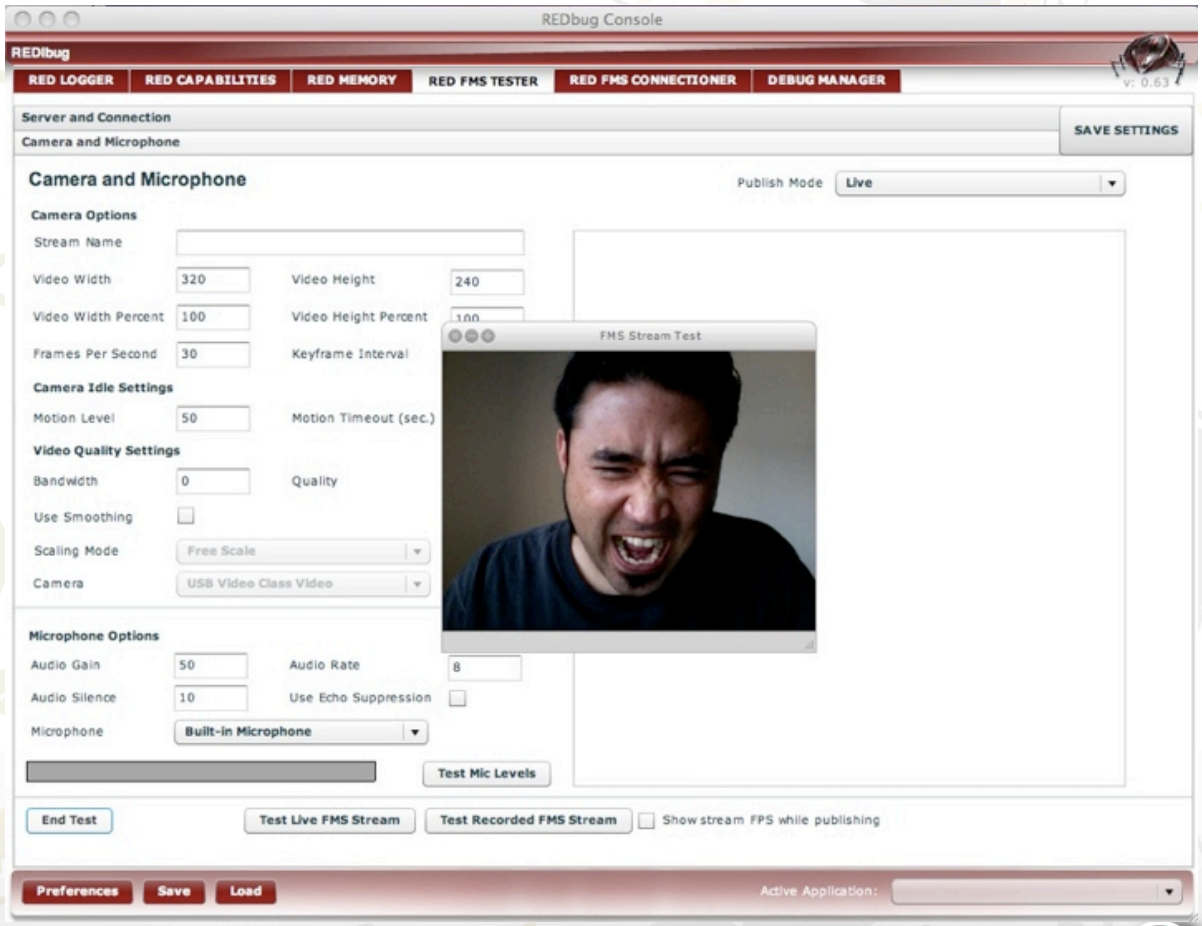
De MonsterDebugger

Robust debugging tool with live data manipulation features



REDbug

Logging tool with robust video and FMS specific tools.



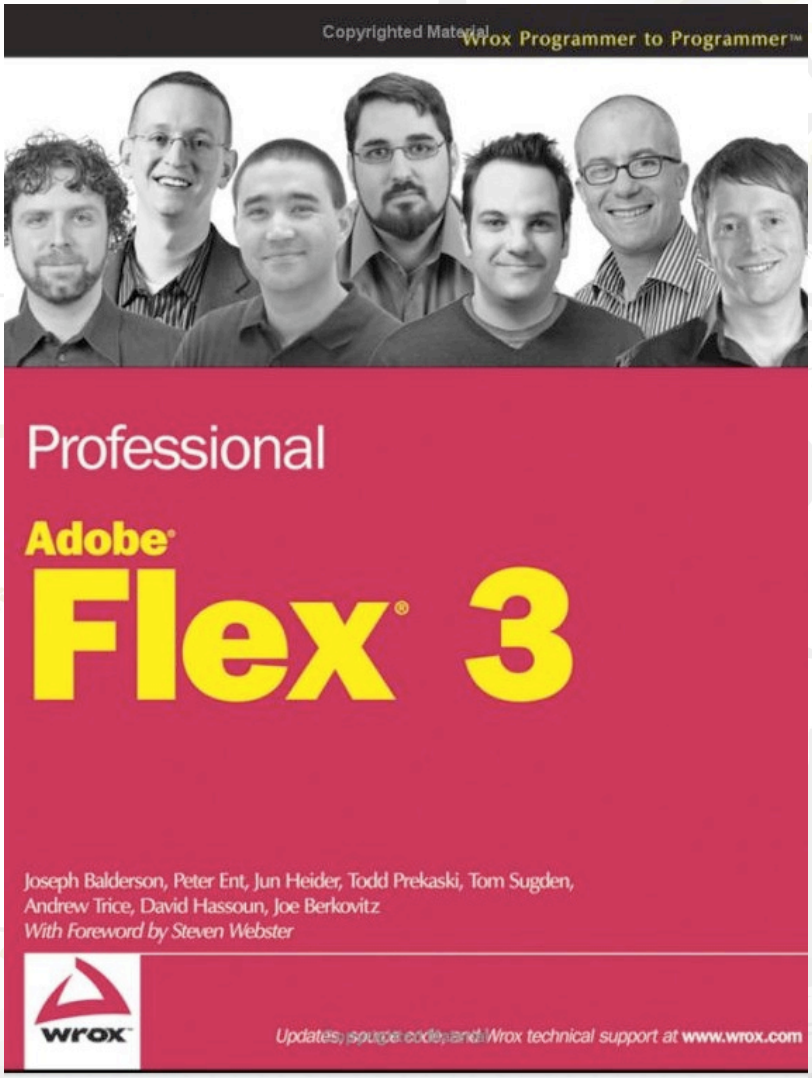
AS3 PTS

AS3 Performance Testing Harness: Useful for performance profiling

```
performancetests.GraphicsTests (5 iterations)
Testing different approaches for drawing.
method.....................................................ttl ms...avg ms
tare [3]                                                        2     0.40
drawPath                                                      135    27.00
drawPathShort                                                 131    26.20
fullPath                                                      166    33.20
reference                                                     125    25.00
shortReference                                                124    24.80
withGraphics                                                 1154   230.80
```

Demonstration: Using third party tools

Book Giveaway Time!



Resources and Contact Info

Resources

A. http://livedocs.adobe.com/flex/gumbo/langref/
B. http://livedocs.adobe.com/flex/gumbo/html/WS65aa2914f20a58eb46e4417112119b3940b-8000.html
C. http://livedocs.adobe.com/flex/gumbo/html/WS6f97d7caa66ef6eb1e63e3d11b6c4d0169-8000.html
D. http://code.google.com/p/flash-thunderbolt/
E. http://demonsterdebugger.com/
F. http://www.redbugtool.com/
G. http://www.gskinner.com/blog/archives/2009/04/as3_performance.html

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THANK YOU!