Building Rich Internet Applications with the ArcGIS API for Flex

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Agenda

- Rich Internet Applications
- Introduction to Flash / Flex
- Using Flex
- ArcGIS API for Flex
- Sample Flex Viewer
- What’s new for Flex at ArcGIS 10
Rich Internet Applications
Rich Internet Applications (RIA’s)

Cool...

- Expressive
- Interactive
- Dynamic
- Allow data fetching without page refresh
Compare and Contrast

Traditional vs. RIA
RIAs Facilitate Data Visualization
Evolution of the Web Client

Back to the “thick” client

- **1st Gen:** HTML Thin
- **2nd Gen:** ActiveX / Java Thick
- **3rd Gen:** Application Server Thin
- **4th Gen:** Rich Internet Applications Thick
Technologies for RIA
Expressive, interactive, dynamic
Introduction to Flash / Flex
What is Flash?

- Technology for delivering RIA to browser
- Flash apps are compiled executables
  - Delivered as a SWF file
  - Embedded within HTML
- Runs in the Flash Player
  - Plug-in
- You have seen it (even if you don’t know it).
Advantages of Flash

• Ubiquity
  – Except iPhones and iPads…

• Cross-browser compatibility

• Compiled
  – Discover errors at compile-time vs. run time

• Layout tools

• Built-in transitions and effects
Disadvantages of Flash

- Plug in required
- Larger ‘home’ page = longer load time
- Player version compatibility
- Search Engine Optimization (SEO)
- 508 Compliance
- Tendency to over design – over animate
What is Flex?

• Adobe Flex is the open source development environment used to create Flash applications
• Flex development tools
  – Adobe Flex Builder is a work bench (IDE)
    • Based on Eclipse
    • Accelerate development
    • Costs:
      – $250 standard
      – $700 professional
  – Adobe Flex Open SDK
    • Open source compiler
    • Some ‘free’ IDEs on web
    • Can use Notepad to write Flex Applications

FYI: The next release of Flex Builder will be called: “Flash Builder 4.0”
Hybrid of Two Programming Languages

• **MXML**
  – XML based tags
  – Declarative user-interface definition language
  – Used to create what we see

• **ActionScript**
  – Ecma-based scripting language
  – Object oriented
  – Used to define what the application does (business logic)
<mxm xmlns:mx="http://www.adobe.com/2006/mxml" layout="vertical" horizontalAlign="center">

<mx:Script>

<![CDATA[

private function onButtonClick():void {
    lblReport.text = "Hello World!";
}

]]>

</mx:Script>

<mx:Button label="Click Me!"
<mx:Label id="lblReport"/>

</mx:Application>
SWFs & SWCs

• Applications are compiled into SWFs*
  – Compiled Flash application file that is deployed on the web server

• Component libraries can be compiled into SWCs
  – Shared between developers
  – Re-used across projects

* It’s also possible to compile as a desktop app, which is called an AIR app.
Resources

Adobe.com

ArcGIS Resource Center
Other Good Tips!

Tour de Flex  
scalenne.com
ArcGIS API for Flex

- Collection of ActionScript classes
- Delivered as a SWC
- Provides
  - Map canvas
  - Various GIS objects
    - e.g. Graphic, Polygon, Layer, Symbol, Renderers
  - Utilities
    - e.g. Toolbars
- Handles communication w/ ArcGIS Server
- Uses the REST API

Can also communicate with Bing Maps & can be customized to talk to other data sources.
REST = Representational State Transfer

- Popular web architecture
- The URL tells the story:
- Can return
  - Text
  - XML
  - JSON
  - Images
  - Binary
ArcGIS Server REST API

- Provides simple, open web interface to services hosted by ArcGIS Server
- Capabilities include:
  - Map
  - Query
  - Geocode
  - Geoprocessing
  - Geometry
  - Image
  - Network
Using the API

- Download the SWC (from the Resource Center)
- Add to Flex Project build path
- Begin coding!
Tips

- Get a web debugger
  - e.g. Fiddler, Firebug

- ArcGIS Resource Center
Some Application Examples

- Analyst’s Journal
- DHS Fusion Centers
- H1N1 Viewer
- FAA Vertical Obstructions
- Chesapeake Watershed Profiler
- Our National Parks
Sample Flex Viewer

- RIA GIS viewer built with the ArcGIS API for Flex
- Available through the Resource Center’s Code Gallery
  - Source code provided
- Designed as a template
  - Configurable
  - Plug in your own data
- Uses a widget framework
  - Extensible
How do I get the Flex Sample Viewer?

- Resource Center → Code Gallery
Configuring the Sample Flex Viewer

- Configure to add organizational branding
- Configure to use your data
  - Uses a series of config files
Creating your own Widgets

- Widget architecture allows you to plug in:
  - Your own custom widgets
  - 3rd party widgets
- Developer’s Guide explains how to develop custom widgets
A note of caution...

• The good news:
  – Flex Sample Viewer is a fantastic way to publish your data.
  – Can be a great foundation for creating applications

• However...
  – It is not a silver bullet
  – Design your application!
    • Requirements
    • User Interface
    • Database
  – Choose your solution based on your design.

Remember that the Flex Sample Viewer is an application – built on top of the ArcGIS API for Flex.
What’s new at 10!
Enhancements to REST at 10

- Support for representing tables
- Handling relates
- Time-aware layers / time queries
- Support for AMF
- Editing!
- Network Analysis enhancements
- Much, much, more!
ArcGIS API for Flex

- At ArcGIS 10, will be called the ArcGIS API for Flex 2.0
- Will support the enhancements made to REST API
- Will feature some other enhancements
  - e.g. Representing point clusters
  - New Sample Viewer
- Will require Flash Builder 4.0
**ArcGIS Web Map for Flash**

- **What is it?**
  - Configurable web mapping application
    - Content and widgets
    - Look and feel (skins and layouts)
    - Easily deployable (your server or on ArcGIS.com)
    - Audience is non-developers
    - Human readable configuration file
  - Improves upon Flex Viewer v1.x
    - Core development
    - Technical support
    - Easier to extend
    - Better looking and ‘richer’
  - Released with 10
Some quick feature demos

- Related records
- Editing
- Time slider
- AMF
- Clusterer
THANKS!!!

Have a good weekend!