Agenda

- API Introduction
- Getting started
- API concepts and examples
- Developer/Deployment workflow
- Road Ahead
- Getting more information
API Introduction
ArcGIS 10 — A Complete System

Easier
More Powerful
and Everywhere

Cloud
Enterprise
Local

- Discover
- Create
- Manage
- Visualize
- Analyze
- Collaborate

Web
Mobile
Desktop
ArcGIS Web APIs overview

- ArcGIS Server REST API foundation
  - ArcGIS resources exposed in a restful manner

- JavaScript, Flex, Silverlight/WPF

- Patterns are the same across all the APIs
A little history

• Well Adopted
• Very active forum
• Community code gallery
• Release schedule

<table>
<thead>
<tr>
<th></th>
<th>Flex API</th>
<th>Flex Viewer</th>
</tr>
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<tbody>
<tr>
<td>April 2011</td>
<td>2.3.1</td>
<td>2.3.1</td>
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<tr>
<td>December 2010</td>
<td>2.2</td>
<td>2.2</td>
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<tr>
<td>September 2010</td>
<td>2.1</td>
<td>2.1</td>
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<tr>
<td>July 2010</td>
<td>2.0</td>
<td>2.0 beta</td>
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<tr>
<td>2008-2009</td>
<td>1.0, 1.1, 1.2 and 1.3</td>
<td></td>
</tr>
</tbody>
</table>
Live Sites

- FanMap: Super Bowl
- Stroke Center Locator
- Solar Boston
- Business Analyst Online
- StateStat – Stimulus Recovery
- Renewable Energy Atlas
Demo: Some examples
What is your relationship with the API?

• ArcGIS Viewer for Flex
  - Extends the API
  - Industry Templates
    - Public Safety, Water/Wastewater, Land Records

• Custom Application using the ArcGIS API for Flex
  - Task focused application
  - Roll your own: business logic leverage the API
Adobe Flash Platform

• The leading solution for delivering rich apps and content across screens and devices

• Enterprise applications
• Consumer / Social applications
• Mobile devices / TV

• http://www.adobe.com/flashplatform/customers/
• http://www.adobe.com/flashplatform/
Adobe Flash Platform and ArcGIS

Multiscreen Content and Applications

Design / Develop
- Creative Suite
- Flash Professional
- Flash Catalyst
- Flash Builder

Framework
- Flex
- ArcGIS API for Flex

Clients
- AIR
- Flash Player

Servers and Services
- AMF, XML, JSON, SOAP, RSS, ATOM, etc.
- HTTP/S, Sockets, RTMP, etc.

ArcGIS API
- ArcGIS Server
Why Adobe Flex Framework?

- Create applications that are,
  - Interactive, responsive
  - Easy to extend
  - Simple, yet powerful
- Consistent across browsers, desktops, devices, and operating systems
- Highly productive, open source, IDE support
- Rich set of components
- Strong developer community
  - http://www.adobe.com/devnet/flex
Getting started
How do I get the API?

- Resource center
  - Download
- Contents
  - Readme, API library, samples, skins
- API Library: collection of classes and assets (“the swc”)
- Samples: same as the resource center
- Skins: look and feel of a UI component

http://resources.arcgis.com
Demo: Resource Center

http://links.esri.com/flex/
http://links.esri.com/flexviewer/
What do I need to get started?

• Requirements for ArcGIS API for Flex 2.x
  - Adobe Flash Player 10
  - Adobe Flex 4 SDK
  - Access to ArcGIS Server services *

• Recommendations
  - Adobe Flash Builder 4.5 (IDE)

• Optional
  - Adobe Creative Suite
    - Flash Catalyst, Flash Professional, Fireworks, etc
ArcGIS Server and ArcGIS API for Flex

Author
- Data
- Resource

Serve
- Services
- REST

Use
- Flex Application

Deploy to Web Server

Develop Applications with API

ArcGIS API for Flex
What will I need to know / learn?

• MXML
  - Declarative XML that gets converted to ActionScript
  - UIComponent, Skinning and Layout

• ActionScript
  - Based on ECMAScript specification
  - Programming language for Flash Player and Flex SDK

• CSS
  - Styling UIComponents and Skins
API concepts and examples
Overview

• Mapping and Visualization
  - Basemaps
  - Operational layers
  - Graphics

• Analysis
  - Tasks
Map

- Main component of the Flex API
- Mouse & keyboard navigation
- Scale bar, pan arrows, cross hair, rubberband, zoomslider (Navigation) can all be styled
- Spatial reference & scale levels
  - Determined by the first visible layer
  - Or can be set explicitly
- Collection of layers
Basemaps, operational layers, and graphics

• Basemaps
  - Provide geographic framework
  - Tiled (cached), static, multi-scale

• Operational layers
  - Focus map
  - Associated with tools and user interaction
  - Typically dynamic in content

• Graphics
  - Use for visualizing task results or user input
  - Client-side features
  - Two types: Graphics Layer and Feature Layer

• Custom layers
Demo: Integrating basemaps and operational layers
ArcGIS ImageService Layer

- ArcGIS ImageService Layer – since 9.3
  - Single source and/or ArcGIS Server Image extension
- Time aware
- Specify bands to display
- Compression quality
- Mosaic rule
- Raster function – Colormap, Hillshade, etc
Graphics Layer

- Graphic = geometry + attributes + symbol
- Rich symbolization
  - Points, Lines, Polygons
  - Pictures, TextSymbol, InfoSymbol
- Event driven model
  - Mouse, keyboard
- Native flex properties
  - alpha, visible, ..
- New in 2.0 clustering
Feature Layer

- Extends Graphics Layer
- Feature Service or Map Service
- Can be layer or table
- Query mode
- Supports:
  - Selections
  - Definition expression
  - Attachments *
- Editable when source is Feature Service *
- Uses drawing info from ArcGIS Server *

* Requires ArcGIS Server 10 or above
Symbol

- Graphics are rendered using symbols
- Uses Flash graphics
- The symbol of a graphic is determined by (in order of preference):
  - The graphic’s defined symbol
  - The renderer defined in the layer
  - The symbol defined in the layer
  - The default symbol defined by our API
Renderers

- **SimpleRenderer**
  - Uses one symbol only

- **ClassBreaksRenderer**
  - Array of ClassBreakInfo

- **UniqueValueRenderer**
  - Array of UniqueValueInfo
  - Support for multiple attributes

- **TemporalRenderer**
  - Use the time field of a FeatureLayer
Demo: Feature Layer
Overview Tasks

• Query, Find (Search), Identify
• Locator Service
• Geoprocessing Service
• Route, Service Area, Closest Facility
• Geometry Service
- Analysis capabilities exposed by an ArcGIS Server REST API resource
## Comparing Query, Find and Identify Tasks

<table>
<thead>
<tr>
<th></th>
<th>Query</th>
<th>Find</th>
<th>Identify</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input type(s)</strong></td>
<td>Where clause</td>
<td>Search Text</td>
<td>Click on Map</td>
</tr>
<tr>
<td></td>
<td>Search Text</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geometry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specify spatial relationship?</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td># of (query) layers</td>
<td>1</td>
<td>&gt;=1</td>
<td>&gt;=1</td>
</tr>
<tr>
<td>Specify attributes to return?</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Return features only?</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Return attributes only?</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>
Locator Tasks

- Capabilities / address styles are tied to the underlying address locator which is the source for the locator service
- Forward and reverse address lookup
- Get candidates for an address (forward)
- Get an address for a given location (reverse)
- Specify the output spatial reference
Geoprocessing model
Geoprocessing Task

- Exposes a Geoprocessing model through an ArcGIS Server service
- Execute = synchronous
- SubmitJob = asynchronous
Network analysis tasks

- Exposes Network Analyst functionality through an ArcGIS Server service
Geometry Service

- A server-side processing and algorithmic resource
- Supports operations related to manipulating geometries
  - Project, buffer, simplify, cut, densify, difference, generalize, union, split
  - Many more ....
- Supports editing functionality with Feature service
Demo: Tasks
UIComponents

- Editor
- Template Picker
- AttributeInspector
- AttachmentInspector

- Navigation, ScaleBar, Legend
- TimeSlider
- LabelDataRenderer
Editing Workflow

Serve

Feature Service

REST

Use

- Editor Component
- Attribute Inspector
- Template Picker
- Attachment Inspector

Author

Enterprise Geodatabase

MXD / MSD
Demo: Editing
Developer / Deployment workflow
Developer workflow

Author Application

- MXML
- ActionScript
- Debug

Compile Application

- SWF
- HTML Wrapper

Deploy to Web Server

- Export Release Build

Run Application

Deliver SWF to Client
Thinking about deployment

- Minimum Flash Player installation (10.x)
  - Wrapper streamlines process
- Uncheck enable integration with browser navigation
- Use Runtime Shared Library (RSL)
- Export “Release build”
- Flash Player cross-domain issues
  - crossdomain.xml
  - proxy page (for security)
Placement of the crossdomain file

Web Server with application and ArcGIS Server

SWF

Map requests and responses

ArcGIS Server with crossdomain.xml

Web Server with application

SWF

Map requests and responses
Road Ahead
Road ahead

- ArcGIS API for Flex 2.4
- ArcGIS Viewer for Flex 2.4
- KML, WMS enhancements
- Better support Adobe 4.5 and mobile development
  - Android, iOS
  - Mobile samples
- More languages / localization
  - Arabic, Russian, Brazilian Portuguese, Italian
- Compatible with Flex 4.5 and Flash Builder 4.5
Road ahead matching versions

- 2.x API matched 10.0*
- 3.x API will match up with 10.1
- ArcGIS API for Flex 3.0
  - Adobe 4.5 SDK requirement
  - Flash Player 10.2 requirement
- Thanks to REST 1x, 2x and 3x API all work with 9.3 thru 10.1
- Certain functionality requires certain server and API versions
Getting more information
Where can I get more information?

Adobe and Esri resources

- **Esri**
  - [http://resources.arcgis.com](http://resources.arcgis.com)
  - Forums, samples
  - [http://links.esri.com/flex](http://links.esri.com/flex)
  - [http://links.esri.com/flexviewer](http://links.esri.com/flexviewer)

- **Adobe**
  - [http://groups.adobe.com](http://groups.adobe.com)
Esri Training for Developers

http://www.esri.com/training

• Instructor-Led Courses
  - Building Web Applications Using the ArcGIS API for Flex, JavaScript, or Microsoft Silverlight/WPF
  - Introduction to ArcGIS Server
  - Creating Effective Web Applications Using ArcGIS Server

• Online Training Seminars
  - Free, one-hour presentation and demos by Esri technical experts
  - Live seminar broadcast on a new topic every month
UC 2011 Agenda: Technical Workshops

- **ArcGIS API for Flex - Advanced Topics**
  - Tues 10:15 – 11:30 AM  Room 8
  - Thurs 8:30 – 9:45 AM  Room 8

- **ArcGIS Viewer for Flex - An Introduction**
  - Tues 10:15 – 11:30 AM  Room 5 A/B
  - Thurs 8:30 – 9:45 AM  Room 5 A/B

- **The Road Ahead**
  - Wed 4:05 – 4:25 PM  Room 6A

- **Flex Appeal**
  - Wed 12:00 – 1:00 PM  Room 8
UC 2011 Agenda: Demo Theater Presentations

• Changing the Look and Feel of Your ArcGIS Viewer for Flex Application
  - Wed  5:00 – 5:45 PM   Exhibit Hall C
  - Thurs 12:00 – 12:45 PM Exhibit Hall C

• Creating Your Own Custom Widget for the ArcGIS Viewer for Flex
  - Thurs 11:00 – 11:45 AM   Exhibit Hall C
UC 2011 Agenda: additional information

- Adobe Flex Special Interest Group (SIG)
  - Tues 12:00 – 1:00 PM   Room 5 A/B
Summary

• API Introduction
• Getting started
• API concepts and examples
• Developer/Deployment workflow
• Road Ahead
• Getting more information
Questions / Answers

Please fill in the survey..... Thank you

• http://www.esri.com/sessionevals