ArcGIS API for Flex
An Introduction
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Introduction

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Agenda

• Introduction
• Build a map
• Display information
• Perform analysis
• User interface components
• Wrap up
Live Sites
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Introduction

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Who are you? What brings you here?

- **Developer**
  - API
  - Source code
- **Builder**
  - Application Builder
  - Viewer configuration
- **Hybrid**
  - Designer / Developer
Adobe Flash platform tools

• Together can build web
desktop, mobile apps

• Flash Builder

• Flex SDK (framework)

• Client runtimes
  - Flash Player
  - Adobe Air
ArcGIS for Flex
API and Viewer

- Well established
- Very active user community
- Consistent release schedule

Version 3.2
March 2013

Version 3.3
April 2013

Version 3.4
July 2013
What will you need?
Developer workflow

• Configure
  - Application Builder
  - Compiled viewer

• Develop
  - API sample code (GitHub)
  - Viewer and Application Builder (GitHub)
  - API library (developers.arcgis.com)
Requirements

• ArcGIS 3.4 API for Flex
  - Flash Player: 11.1
  - SDK: Adobe Flex 4.6 or Apache 4.8 or later
  - Access to ArcGIS web services

  • Readme
  • API Library (SWC)
  • Skins, locales

• Recommendations
  - Adobe Flash Builder 4.7 (IDE)
Additional learning

- **MXML**
  - UIComponent, Skinning and Layout
- **ActionScript**
  - Programming language
- **CSS**
  - Styling UIComponents and Skins
- **JavaScript**
  - Mostly used in the html wrapper

**Tip:** Read the source code
Help and resources

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Build a map

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Map basics

• Main component of the Flex API
• Collection of layers
• Contains defaultGraphicsLayer
• Provides mouse & keyboard navigation
• Touch and rotation
• Spatial reference & scale levels
  - determined by the first visible layer
  - or can be set explicitly
Data, layer(s), and map

- Data pulled from services or ArcGIS Online
- Layers
  - Service url
  - Shared service
  - Web map
- Map container
Add data to the map

- Either:
  - Using layers (services), reference URL
  - Web maps, reference item ID
Layer basics

- Full list @ Types of layer

- ArcGIS TiledMapServiceLayer
- OpenStreetMapLayer
- WMTSLayer
- VETiledLayer
- ArcGIS Local TiledLayer
- WebTiledLayer
- ArcGIS Dynamic Map Service Layer
- ArcGIS Image Service Layer
- GPResultImageLayer
- WMSLayer
- ArcIMS Map Service Layer
- GraphicsLayer
- FeatureLayer
- CSVLayer
- GeoRSSLayer
- KMLLayer
- MapImageLayer
Finding service URLs

• Services directory
  - Provides endpoint URL for ArcGIS Server services

• Resources and their supported operations
Finding web map IDs

- ArcGIS Online details

Item ID
Build a map

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Display information

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Server versus Client-side rendering

- **Server-side**
  - MapServer (dynamicLayer)
  - Tell server to generate renderer and symbology
  - Supports thematic mapping for large complex datasets
  - No geometry payload and dynamic rendering

- **Client-side**
  - FeatureLayer, GraphicsLayer
  - Use logic to create your own renderer and symbology
  - Graphics are already in browser
  - Potential graphics limitations, network payload
Dynamic Layers

- Service details
  - File GDB or Enterprise GDB
  - Capability during publishing
  - Dynamic per request
  - Supports Dynamic Layers
- Rearrange layer order
- Modify symbology of layers
- layerDrawingOptions property
Graphics Layer

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

- Extends Graphics Layer
- Feature Service or Map Service
- Can be a layer or a table
- Supports selections – query mode
- Supports attachments
- Editable when source is Feature Service *
- Uses drawing info from ArcGIS Server *
- Ownership based access control – new at ArcGIS 10.1
Dynamic labeling
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Perform analysis

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Tasks overview

- Perform specific types of analysis
Tasks

- Analysis capabilities exposed by an ArcGIS web service
- Query, Find (Search), Identify
- Route, Service Area, Closest Facility
- Geometry Service
- Locator
- Geoprocessing Service
- Print
- Generate Renderer
Query task

- Set criteria with “where”
- Filter returned fields
- Set spatial relationship (e.g. “intersects”)
- Searches are case sensitive
- Related records, ObjectIDs, Stand-alone tables
Geoprocessing tasks

- Custom analysis
- Execute vs. SubmitJob
- Tip: Parameters
  - Name, Type, Direction
Geometry service

- A web service for spatial relationships and algorithms
- Supports operations related to manipulating geometries
  - Project, buffer, simplify, cut, densify, difference, generalize, union, split, etc.
- Supports editing functionality with a Feature service
- Geodesic calculations – *ArcGIS 10.1
Query your data

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User interface components

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Editor component

- **Properties**
  - FeatureLayer
  - Geometry service
  - Map

- **Leverages**
  - TemplatePicker
  - DrawTool
  - EditTool
  - AttributeInspector
  - IdentityManager
Access feature data from the cloud
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AttributeTable component

- Interactive data table
- FeatureLayer
- Supports editing
- Export to csv
- Supports related records
- Custom field editors
Display tabular data

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Geocoder component

- Extends TextInput component
- autoComplete, autoNavigate*
- ArcGIS online world locator or your own
- Supports searching map services
- Map
Find places and addresses

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Directions component

- Map
- Symbols
- Stops
- Geocode options
- Routing options
- Route and navigation information
Route and navigate

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Wrap up

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Deployment
Cross-domain policies

Web Server with application and ArcGIS Server

Map requests and responses

SWF

Web Server with application and crossdomain.xml

Map requests and responses

SWF

Road ahead

- Geoenrichment
- Offline / Sync
- ArcGIS.com / Portal for ArcGIS
- Tile resampling
Where can I get more info?

• Esri
  - http://resources.arcgis.com
    - documentation, forums, samples
  - http://links.esri.com/flexviewer

• Adobe
Esri training for Web developers

- http://www.esri.com/training

- **Instructor-Led Courses**
  - Building Web Applications Using the ArcGIS API for Flex (3.x)
  - Migrating to ArcGIS 10.2 for Server
  - ArcGIS for Server: Sharing GIS Content on the Web (10.1)

- **Online Training Seminars**
  - Extending the ArcGIS Viewer for Flex (3.x)
  - Free, one-hour presentation and demos by Esri technical experts
  - Live seminar broadcast on a new topic every month
UC Agenda: Flex Technical Workshops

• ArcGIS API for Flex – An Introduction
  - Tues. 7/9; 1:30-2:45 – Rm 15A
  - Wed. 7/10; 1:30-2:45 – Rm 15B

• ArcGIS Viewer for Flex – An Introduction
  - Wed. 7/10; 8:30-9:45 – Rm 14B

• ArcGIS Viewer for Flex – Advanced Topics
  - Wed. 7/10; 10:15-11:30 – Rm. 14B
  - Thurs. 7/11; 1:30-2:45 – Rm 31C

• ArcGIS API for Flex – Advanced Topics
  - Wed. 7/10; 3:15-4:30 – Rm. 15A
  - Thurs. 7/11; 8:30-9:45 – Rm. 15A
Thank you...

Please fill out the session evaluation

*First Offering ID:  1247*

*Second Offering ID:  1354*

**Online** – www.esri.com/ucsessionssurveys

**Paper** – pick up and put in drop box