Web AppBuilder for ArcGIS
Customization and Extension

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Let’s talk about App Creation
10 challenges for people building apps

- Quickly turn business requirements into usable apps
- Build apps without dependencies on developer skills
- Easily maintain apps
- Unified UX to build apps that work across multiple form factors and platforms
- Understand how apps are used by end-users
- Understand if the apps are effective at getting the job done
- Secure apps, their content and functionality
- Deploy apps simply and securely
- Monitor and control the use of premium services
A Traditional way to Build an App
A different way to Build an App

GUI Builder

widgets

Themes

Stem App

config

An App
225,458 Total AppBuilder Apps

- 36% Private
- 35% Public
- 15% Account
- 14% Shared
App has changed...
App Lifecycle is complex

Apps are data

Apps are disposable

Apps are a conduit to understand your users
App Lifecycle

- conception
- design
- configure
- test
- retire
- revise
- use
- deploy
- analyze
- track
Builder

simply, app creation made easier
Create a Widget
Introduce Web AppBuilder widgets and how to create a widget

Create a Theme

What’s Coming
What are the exciting new features and functions introduced recently

Q&A
Introduction
Web AppBuilder for ArcGIS
Building Web Apps for Your Organization
Using the ArcGIS API for JavaScript
Web AppBuilder (Developer Edition)
Widget

• Execution at run time
• Configure-in, not cut/paste
• Self sufficient and distributable
• Need container, no coding block
• Has programing framework of container

Theme

• Applied at run time
• Configure-in, not modify css
• Need container
• Self sufficient and distributable
• Has programing framework of container
Widgets
Building blocks of apps
Break the code into files

MyWidget.css
```css
html, body, map{
  height: 100%;
  margin: 0;
  padding: 0;
}
```

MyWidget.js
```javascript
define(['dojo/_base/declare', 'jimu/BaseWidget'],
  function(declare, BaseWidget){
    var clazz = declare([BaseWidget],{
    });
    return clazz;
  });
```

MyWidget.html
```html
<div id="feedback">
  <h3>Washington State</h3>
</div>
```

Tutorial: https://developers.arcgis.com/javascript/jshelp/intro_custom_dijit.html
Inheriting from BaseWidget

A widget derived from the BaseWidget class

```javascript
define(['dojo/base/declare', 'jimu/BaseWidget'],
    function(declare, BaseWidget){
    var clazz = declare([BaseWidget],{
    });
    return clazz;
});
```
Dijit lifecycle

- postCreate
- startup
- ...

Widget events

- onOpen, onActive
- onClose, onDeActive
**BaseWidget**

- App properties (name, icon, localization)
- App config data
- Widget's config data
- Map object
- Widget state (open, closed, active...)
- Events (open/signIn)
- Widget communication

**Your job?**

- Widget UI (HTML/template)
- Widget config file (JSON)
- Widget styles (CSS)
- Localization
- **Your unique business logic / workflows (JavaScript)**
Widget Files

```javascript
define(['dojo/_base/declare', 'jimu/BaseWidget'],
    function(declare, BaseWidget){
    var clazz = declare([BaseWidget],{
    });
    return clazz;
    });
```
Getting Started…

1. Download developer edition
2. Connect to organization or portal
3. Copy widget template
4. Run the builder
5. Create an app with your widget
6. Build your widget in the app
Configure your custom widget inside the builder

Building a UI for the user

- Setting.js
  - Config info
  - getConfig, setConfig
- Setting.html
- Usual localization pattern
- css
Widget to Widget **Data Sharing / Communication**

...using the **DataStore**

- Get all data, or..
- Data from a specific widget
- Handled through events
- Widget loading order handled

- Can load another widget: `this.openWidgetById`
Extra data source

- Configure a layer or statistics
- Configure the refresh interval of the data
- Currently supported by InfoGraphic widget
Feature Actions

- Your widget can work with selected feature sets
- Example: Zoom To, Export to CSV, send to GP
Feature Actions
Feature Actions

manifest.json

```
... "featureActions": [{
    "name": "ShowVertex",
    "uri": "myFeatureAction"
}]
```

“myFeatureAction.js”

```
isFeatureSupported: function(featureSet){ return...

onExecute: function(featureSet){...}
```

Widget.js

```
Do something

WidgetManager.getInstance().triggerWidgetOpen(this.widgetId)
```
Create a feature action in your widget

A feature action is a piece of code that is requested to execute on one feature or a set of features. Web AppBuilder provides some out-of-the-box feature actions, such as **Zoom To**, **Export to CSV File**, and **View in Attribute Table**. Additionally, you can create your custom feature action by extending the `BaseFeatureAction` class. The following steps demonstrate how to create a feature action in the Demo widget that shows the count of vertexes for a selected feature set.

**Note:**
The complete code is available in the Demo widget. Access the following URL to play the feature action in the Demo widget:

```
http://<your host machine>:3344/webappviewer/?config=sample-configs/config-demo.json
```

Create a feature action class

1. Browse to the `\client\stemapp\widgets\samplewidgets` folder under the Web AppBuilder installation.

2. Under the Demo widget folder, create a new text file named `ShowVertexFeatureAction.js`.

3. Copy and paste the following code snippet into the file. It creates a feature action class named `ShowVertexFeatureAction` that counts the vertexes of a selected feature:

```javascript
var ShowVertexFeatureAction = BaseFeatureAction.extend({
    _createTarget: function (selectedFeature) {
        return selectedFeature.getVertexesCount() || 0;
    }
});
```

4. Save the file and run the Demo widget to see the feature action in action.
Theme
App in style with personality
Theme is you
Because you are special
Your apps deserve to stand out from the crowd. via creating your own theme
A menu of tools
Shortcut items
Interactive content
Map, of cause
The “player”
Theme Convention and Defaulting

A Theme

- images/
  - icon.jpg

- layouts/
  - a-layout-name/
    - icon.jpg, config.json

- panels/
  - a-panel-name/
    - images/

- styles/
  - a-style-name/
    - Panel.js, Panel.html

- widgets/
  - manifest.json
Create a Theme

Embrace your own style
My pretty layout

My cool color

FF8000
What’s Coming
Evolution with excitements
Web AppBuilder is greatly appreciated by our users..

however, we can’t stand still in this fast moving world...
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less coding

Limited needs for grand-up dev works

cheaper
table better UX

faster

simpler

managed

added value
What Esri Has

Configurable App simplifies the app creation

• Web AppBuilder (WAB), as a tool, has significantly simplified the app creation process
• Since the first WAB release, in two years, more than 220,000 apps are created and hosted on ArcGIS Online

• However, as a tool, WAB can only partially meet the customer’s requirements for apps (in previous slides)
• Esri app creation needs to evolve into being a system to encapsulate the whole app stack and requirements
• Hence ...
What is App Builder for ArcGIS

... a web user experience for creating and managing app through the app’s lifecycle

... is the evolution of Web AppBuilder, an integrated and unified web user experience

- Configuring and creating apps
- Managing app’s lifecycle
- Analyzing and reporting the use pattern of the apps
- Allowing integration of other app tools
Anatomy of an ArcGIS app

An App is a living and breathing being made out of...

- Feedback (comments, rating, issues, etc.)
- Function models (i.e., widgets)
- WebScenes
- Themes/Skins
- Configuration
- Source code and revisions
- WebMaps
- Premium Services
- Captured usage data
- Authorization
- Premium Services
App Lifecycle is complex
App
Apps are data
Apps are disposable
Apps are a conduit to understand your users
The Solution for the Whole App Stack

Go beyond configurable apps

Evolving WAB from a tool to be a system to manage the full App lifecycle
Web AppBuilder as a Tool (tool centric)
appbuilder.arcgis.com (app centric)

- Resources (maps...)
- Extensions (widgets/themes)
- Assets (images/icons/...)
- App Lifecycle Management
- Unified Builder UX
- Statistics
appbuilder.arcgis.com UI/UX
Statistics

Apps

46 Total Apps

Web Apps | 3D Apps | Native Apps | 2D Apps

Public | Private | Share

Healthy Apps | Issue Apps | Update

Apps Name | Views

My web app | 1000
Community
For you and by you
Online help documentation

Developer Edition help documentation
http://developers.arcgis.com/web-appbuilder
https://geonet.esri.com/community/gis/web-gis/web-appbuilder
https://geonet.esri.com/groups/web-app-builder-custom-widgets
Creating Web Applications Using Templates and Web AppBuilder for ArcGIS

3 Hours  Wish List

https://training.esri.com
Other Online Resources

• Esri Solutions Widgets:
  - https://github.com/Esri/solutions-webappbuilder-widgets

• Lists of Widgets:
  - http://codesharing.arcgis.com/
  - https://github.com/gavinr/wab-widget-search

• “Awesome ArcGIS” https://github.com/hhkaos/awesome-arcgis
GeoEvent Server: Internet of Things (IoT)

The world is becoming more instrumented every day. This session will be a fun exploration of how various things can be integrated into ArcGIS using GeoEvent Server. Presented by Morakot Pilouk, Ming Zhao and Josh Joyner

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