



Web AppBuilder for ArcGIS: Customizing and Extending

Moxie Zhang and Gavin Rehkemper

2018 Esri Developer Summit | Palm Springs, CA

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

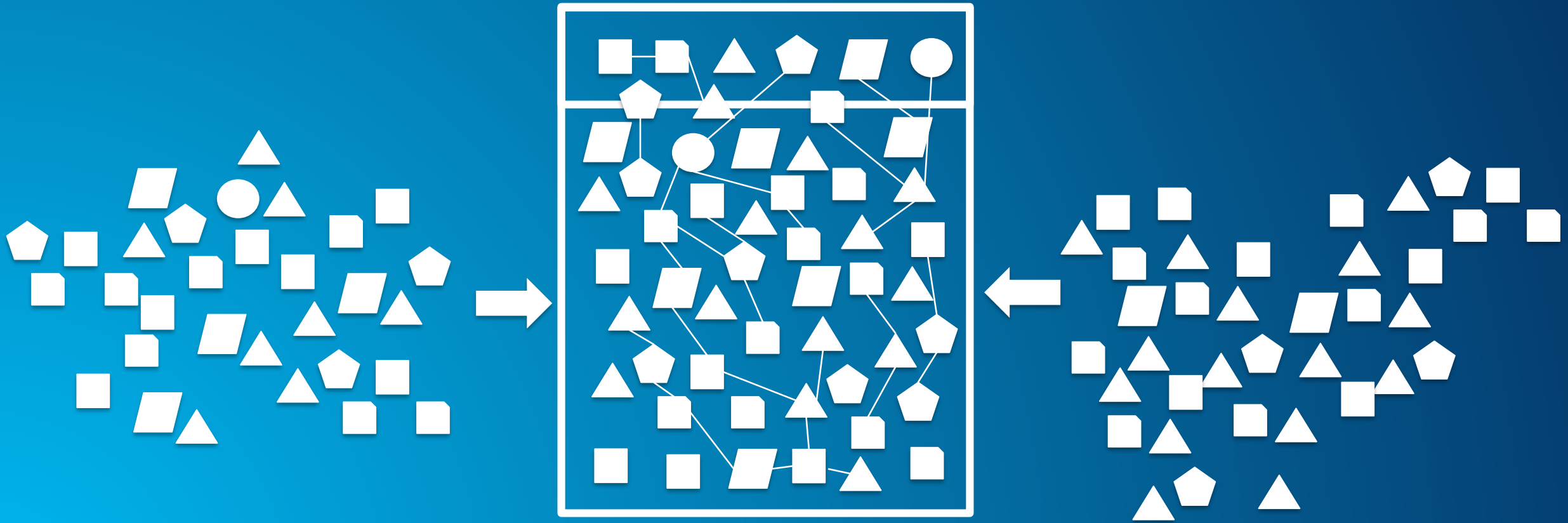
Deploy apps simply and securely

Monitor and control the use of premium services



How did you create apps?

A Traditional way to Build an App



The background is a blue gradient with a wavy, topographic-like pattern. Scattered throughout are several green analog clocks with yellow hands and orange dollar signs (\$).

“Well, that’s not exactly what we wanted...”

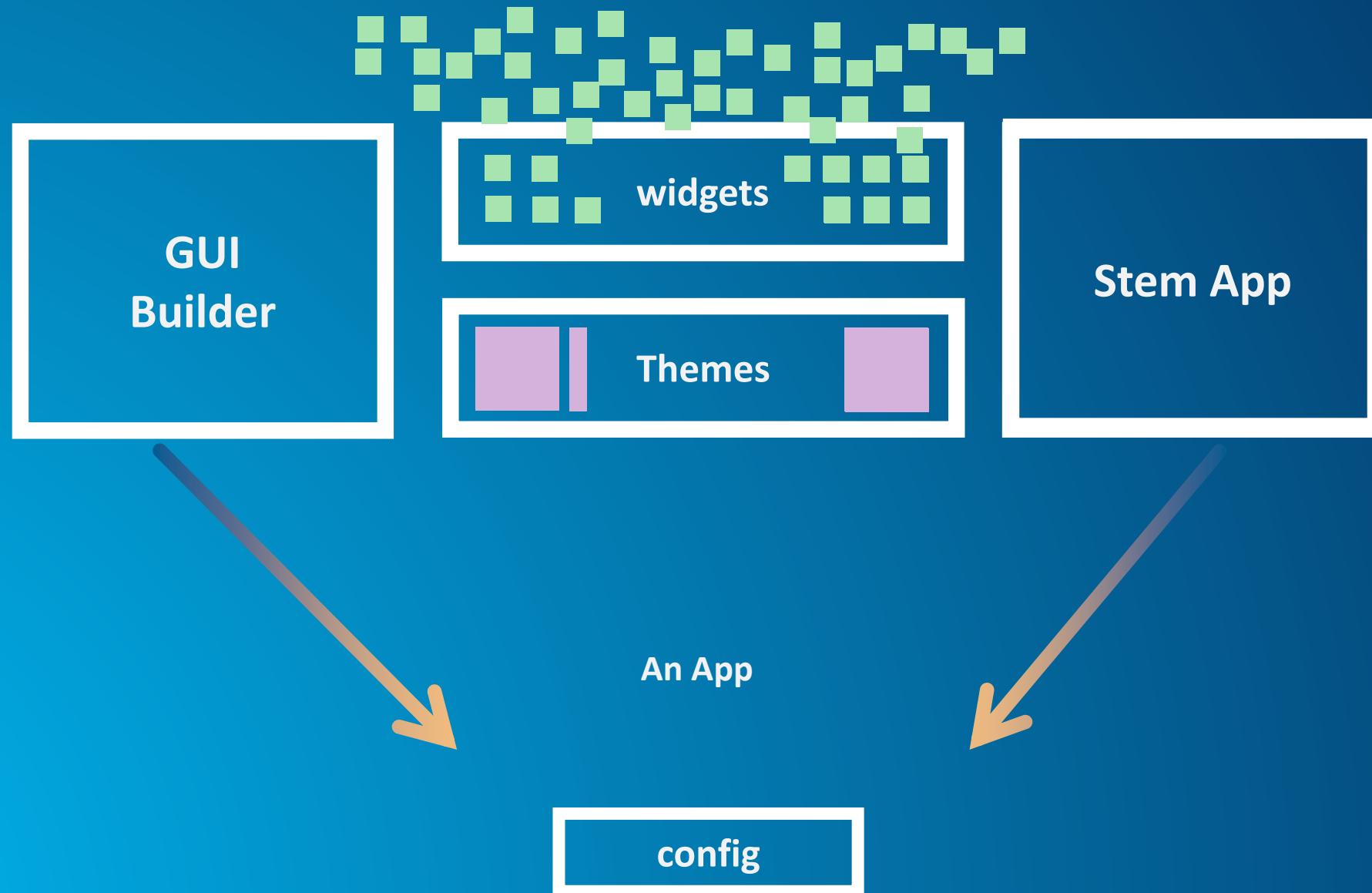


Builder

Simply, build a better experience for the users



A different way to Build an App



Access Type

36%
Private

14%
Shared

326,175

Total AppBuilder Apps

35%
Public

15%
Account

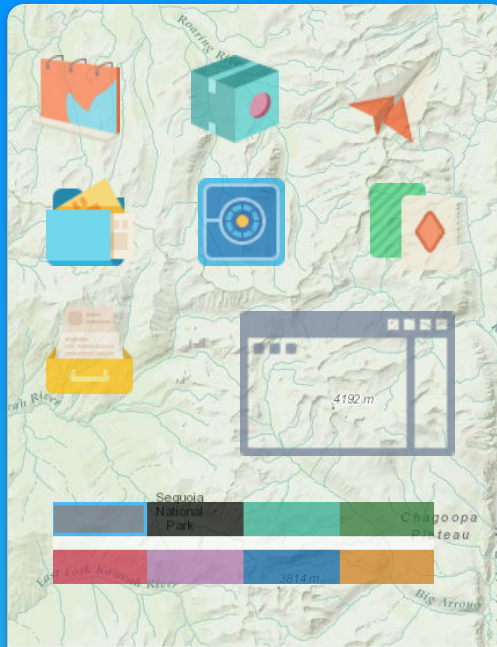




Introduction



Moxie Zhang



Create a Theme



Moxie Zhang



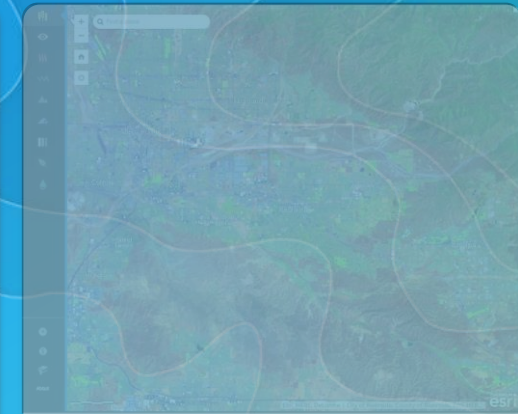
Q&A



Moxie Zhang



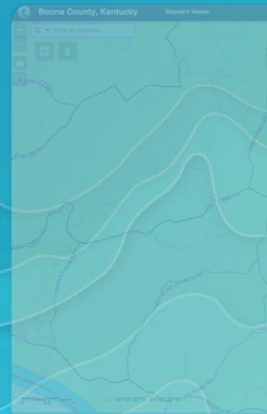
Gavin Rehkemper



Agriculture



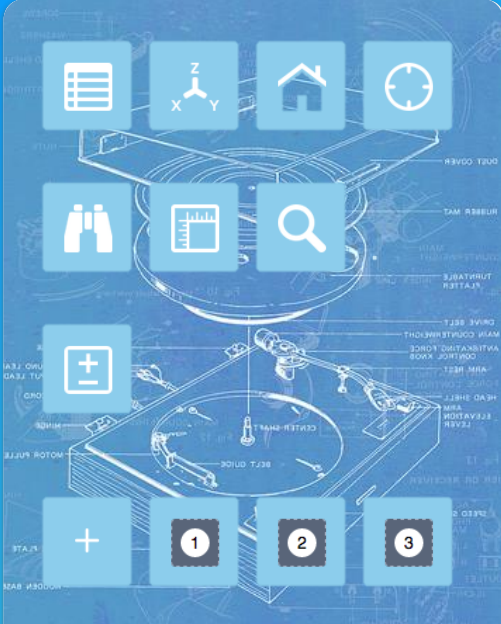
ArcGIS Online WAB Show Case



Boone County



ArcGIS Online W



Create a Widget

Introduce Web AppBuilder widgets and how to create a widget



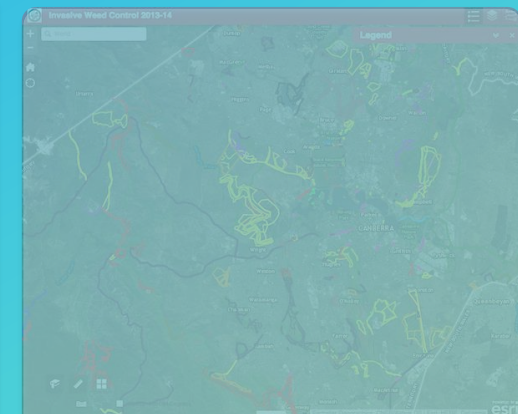
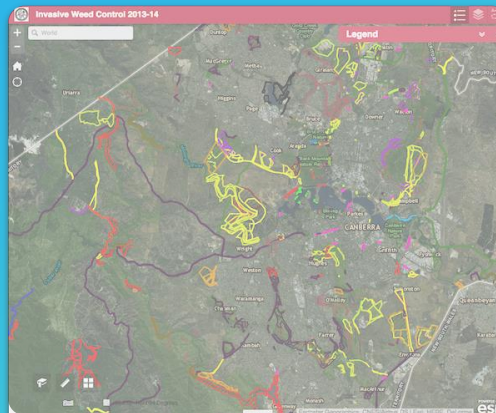
Gavin Rehkemper



WAB Communities



Gavin Rehkemper



Invasive Weed



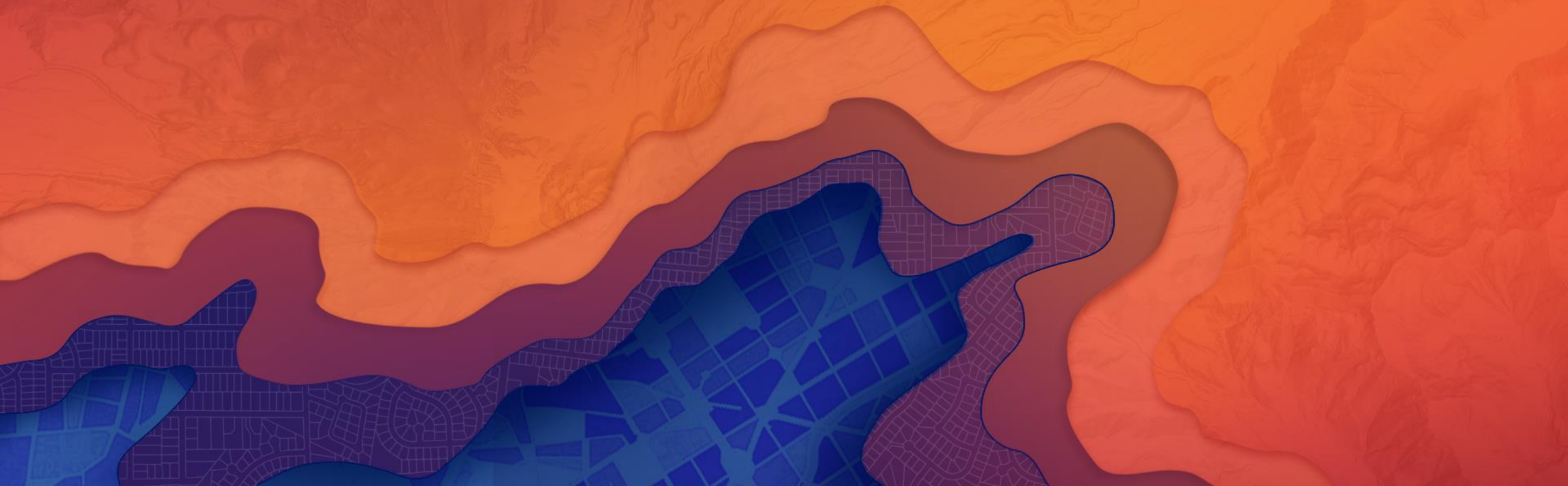
ArcGIS Online WAB Show Case



Muscatine County

Introduction

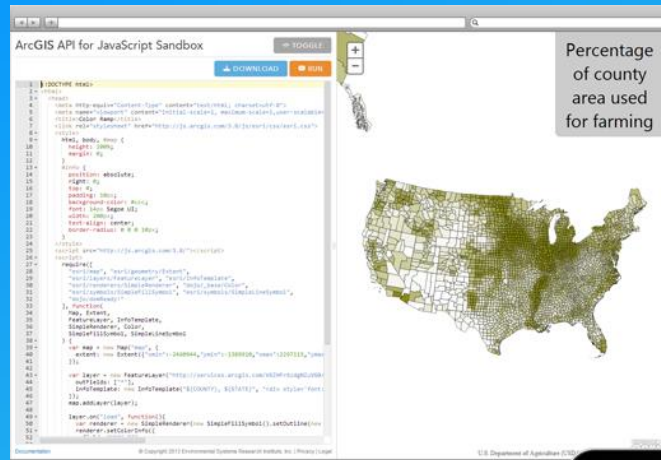
Web AppBuilder for ArcGIS



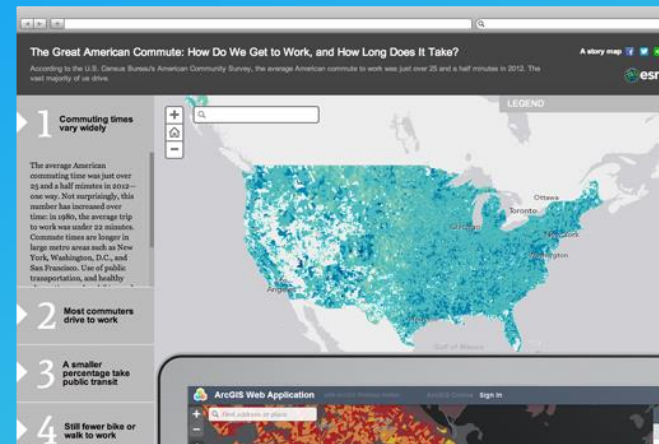
Building Web Apps for Your Organization

Using the ArcGIS API for JavaScript

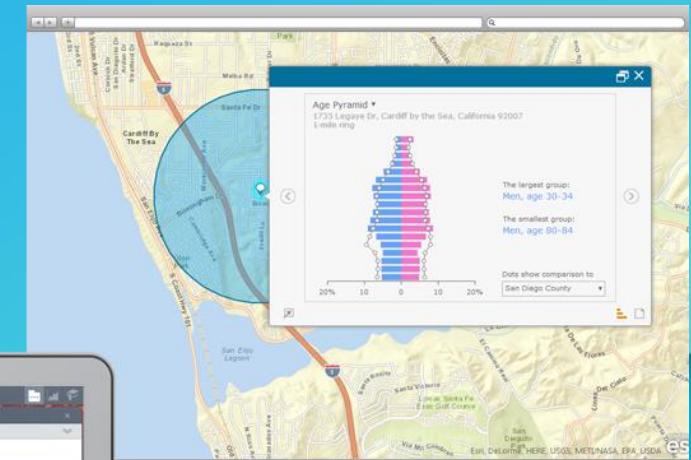
Samples



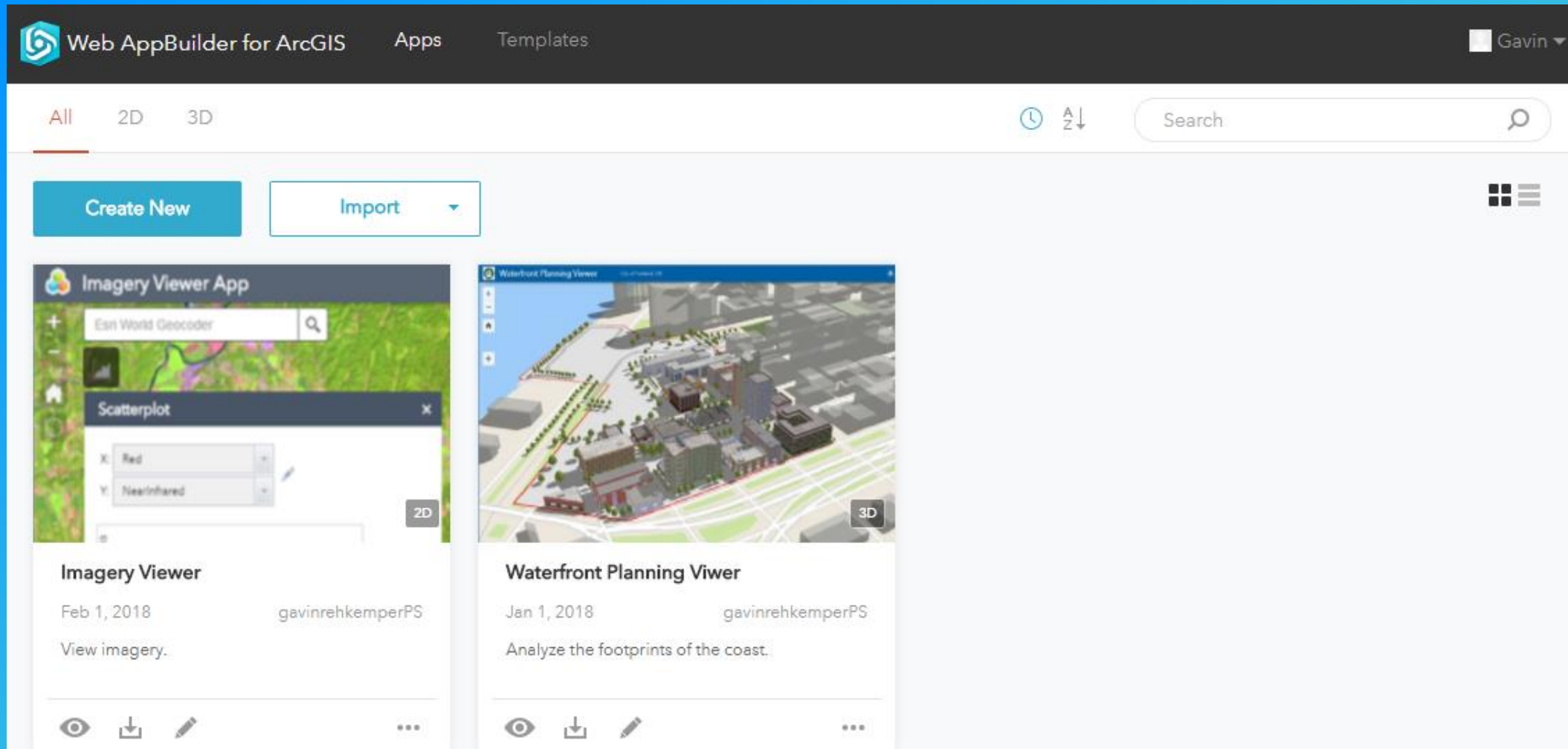
Configurable Apps & Builders



Widgets



Web AppBuilder (Developer Edition)



Widget

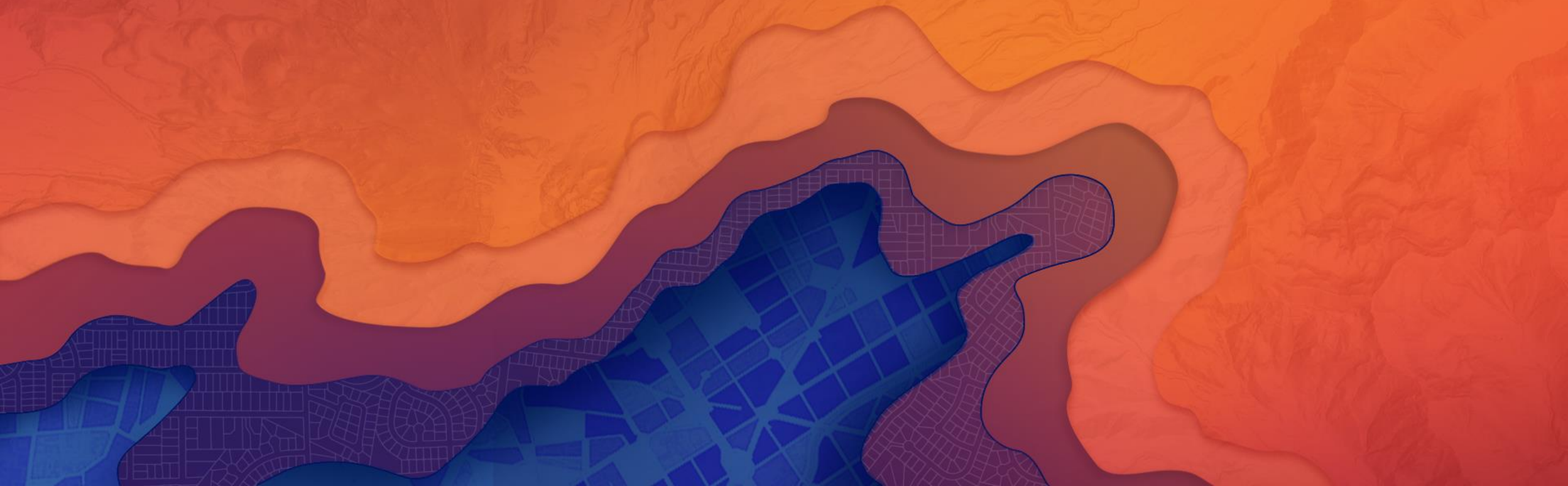
- Execution at run time
- Configure-in, not cut/paste
- Self sufficient and distributable
- Need container, no coding block
- Has programming framework of container

Theme

- Applied at run time
- Configure-in, not modify css
- Need container
- Self sufficient and distributable
- Has programming framework of container

Widgets

Building blocks of apps



It's really just a web app

MyWidget.css

MyWidget.js

MyWidget.html

```
<!DOCTYPE html>
<html>
<head>
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
  <!--The viewport meta tag is used to improve the presentation and behavior of the samples
  on iOS devices-->
  <meta name="viewport" content="initial-scale=1, maximum-scale=1, user-scalable=no">
  <title>Class Breaks Renderer</title>

  <link rel="stylesheet" href="http://js.arcgis.com/3.13/esri/css/esri.css">
</head>
<body>
  <div id="map"></div>
</body>
</html>
```

```
var map;
require([
  "esri/map", "esri/layers/FeatureLayer",
  "esri/InfoTemplate", "esri/symbols/SimpleFillSymbol",
  "esri/renderers/ClassBreaksRenderer",
  "esri/Color", "dojo/dom-style", "dojo/domReady!"
], function(
  Map, FeatureLayer,
  InfoTemplate, SimpleFillSymbol,
  ClassBreaksRenderer,
  Color, domStyle
) {
  map = new Map("map", {
    basemap: "streets",
    center: [-98.215, 38.382],
    zoom: 7,
    slider: false
  });

  var symbol = new SimpleFillSymbol();
  symbol.setColor(new Color([150, 150, 150, 0.5]));

  // Add five breaks to the renderer.
  // If you have ESRI's ArcMap available, this can be a good way to determine break values.
  // You can also copy the RGB values from the color schemes ArcMap applies, or use colors
  // from a site like www.colorbrewer.org
  //
  // alternatively, ArcGIS Server's generate renderer task could be used
  var renderer = new ClassBreaksRenderer(symbol, "POP07_SQMI");
  renderer.addBreak(0, 25, new SimpleFillSymbol().setColor(new Color([56, 168, 0, 0.5])););
  renderer.addBreak(25, 75, new SimpleFillSymbol().setColor(new Color([139, 209, 0, 0.5])););
  renderer.addBreak(75, 175, new SimpleFillSymbol().setColor(new Color([255, 255, 0, 0.5])););
  renderer.addBreak(175, 400, new SimpleFillSymbol().setColor(new Color([255, 128, 0, 0.5])););
  renderer.addBreak(400, Infinity, new SimpleFillSymbol().setColor(new Color([255, 0, 0, 0.5])););

  var infoTemplate = new InfoTemplate("${NAME}", "${*}");
  var featureLayer = new FeatureLayer("http://sampleserver1.arcgisonline.com/ArcGIS/rest/services/Demographics/
  mode: FeatureLayer.MODE_SNAPSHOT,
  outFields: ["*"],
  infoTemplate: infoTemplate
  });
  featureLayer.setDefinitionExpression("STATE_NAME = 'Kansas'");
  featureLayer.setRenderer(renderer);
  map.addLayer(featureLayer);
});
</script>
```

Inheriting from BaseWidget

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

A widget derived from the BaseWidget class

Dijit lifecycle

- postCreate
- startup
- ...



Widget events

- onOpen, onActive
- onClose, onDeActive



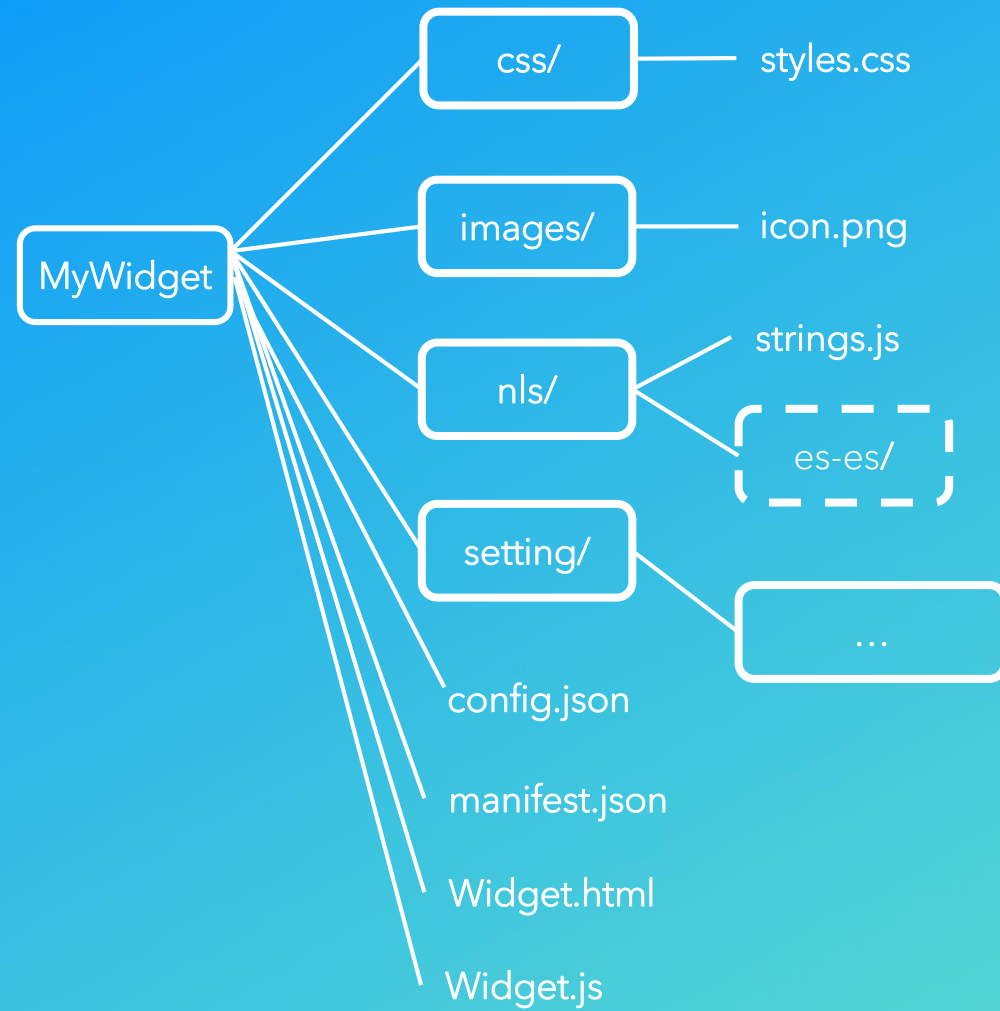
BaseWidget

- 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)**

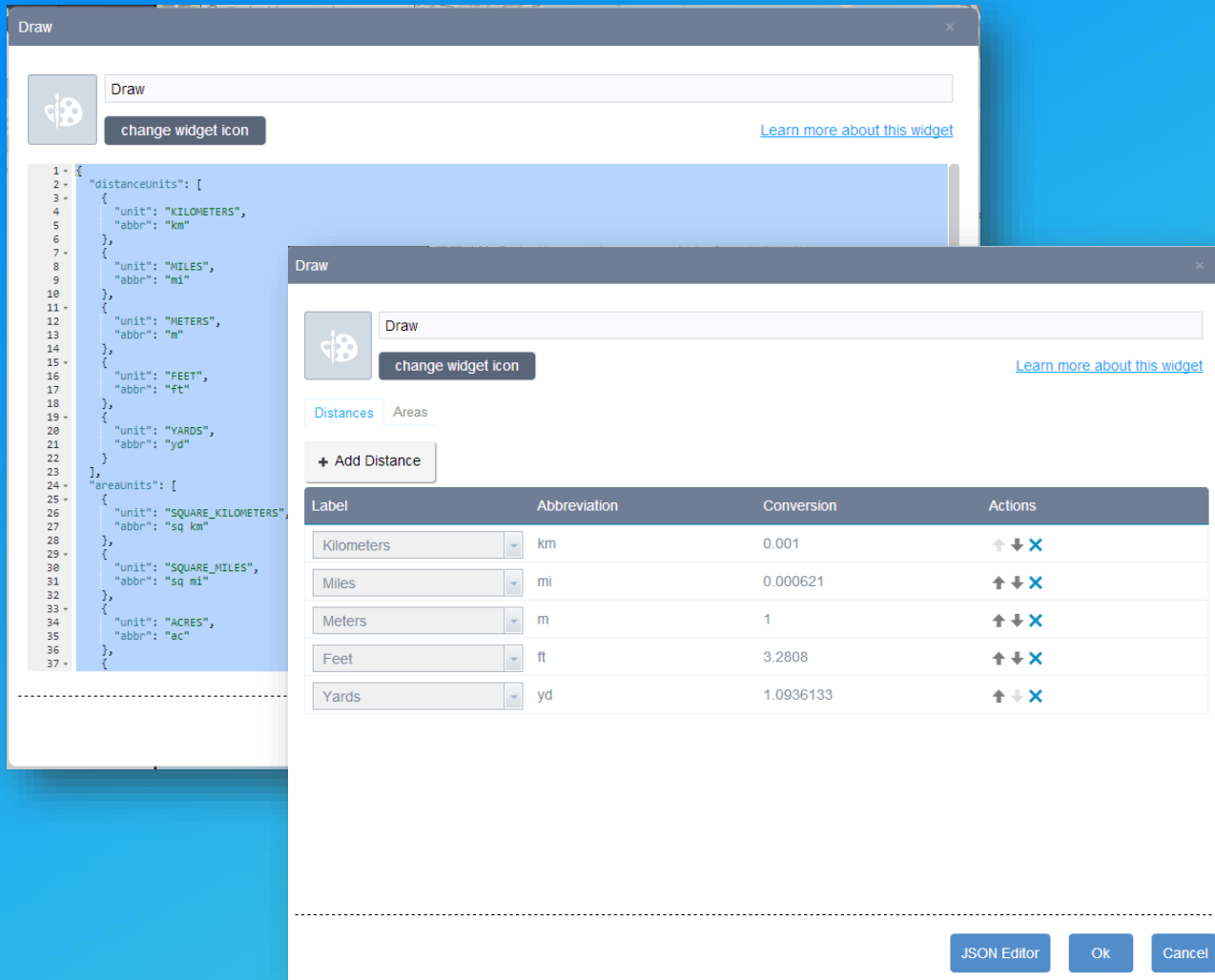
Conventions and Structure



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
- 
- An abstract graphic in the bottom right corner of the slide, featuring wavy, layered shapes in shades of teal and purple, resembling a stylized landscape or topographical map.

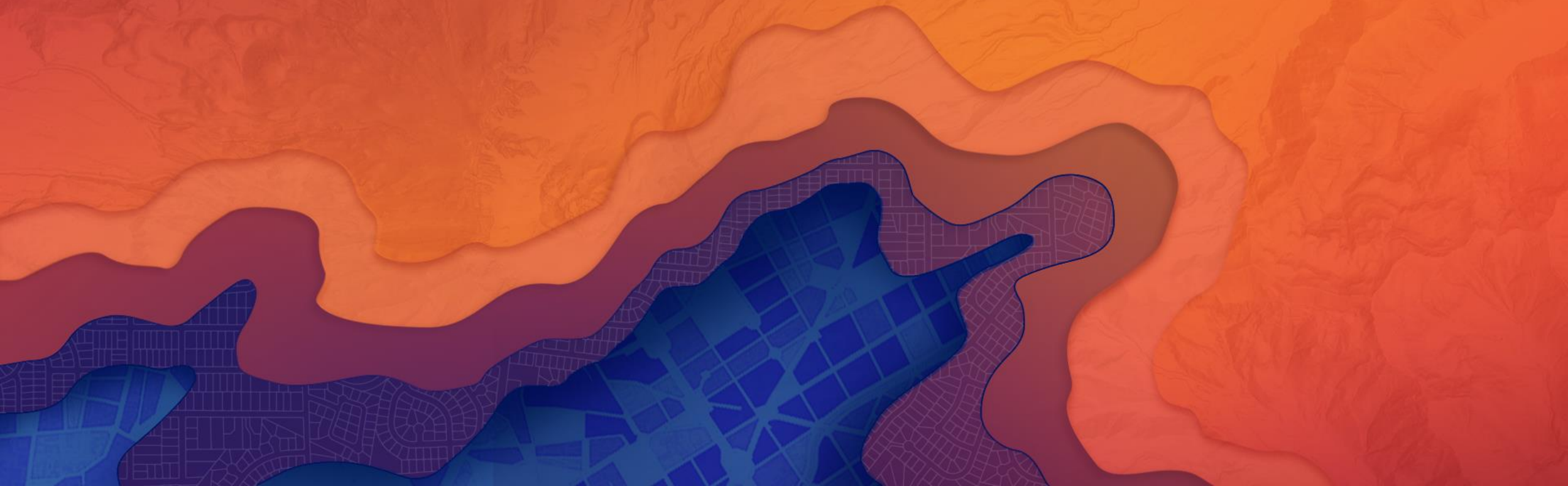
Configure your custom widget inside the builder



- Building a UI for the user:
 - Setting.js
 - Config info
 - getConfig, setConfig
 - Setting.html
 - Usual localization pattern
 - css

Theme

App in style with personality





Theme is you

Specks of GIS

Shirts of GIS

Feet of GIS

Beards of GIS

Because you are special

A field of green poppies with one bright red poppy in the foreground. The background is a soft-focus field of green poppies under a bright, hazy sky. The red poppy is in sharp focus, standing out from the crowd of green ones.

Your apps deserve to
stand out from the crowd.

via creating your own theme

A menu of tools

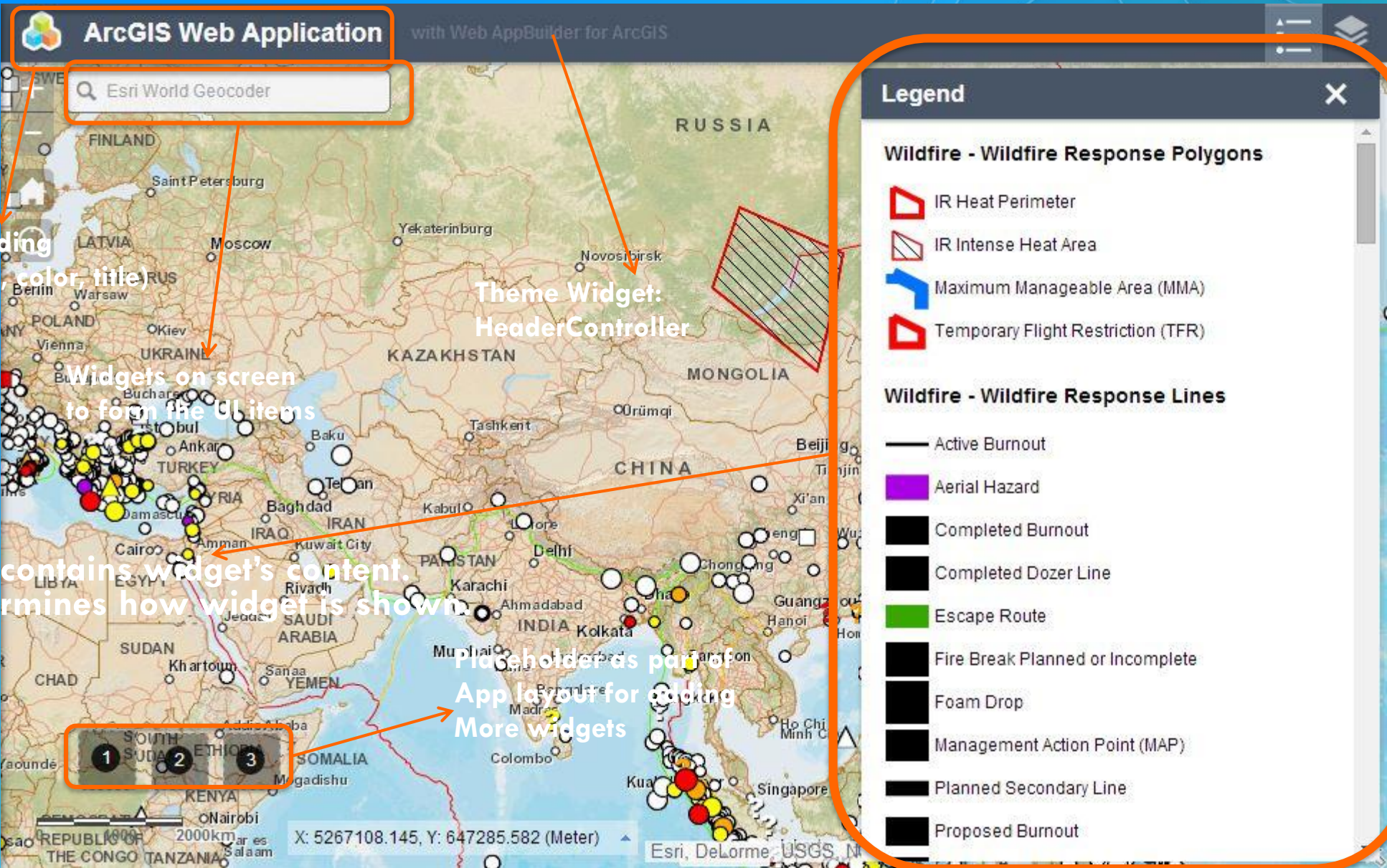
Interactive content

Shortcut items



Map, of course

The "player"



Branding
(icon, color, title)

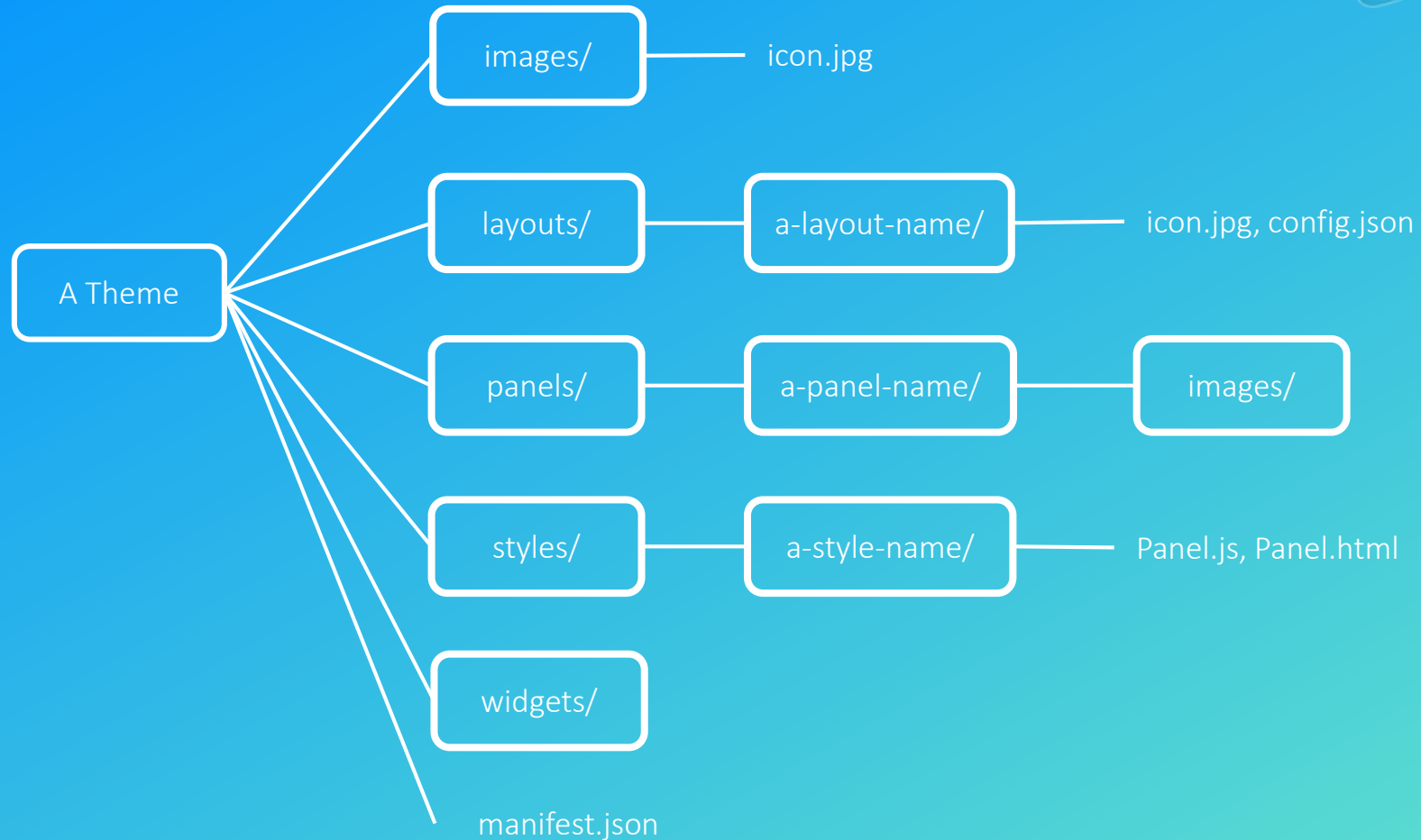
Theme Widget:
HeaderController

Widgets on screen
to form the UI items

Panel contains widget's content.
It determines how widget is shown.

Placeholder as part of
App layout for adding
More widgets

Theme Convention and Defaulting



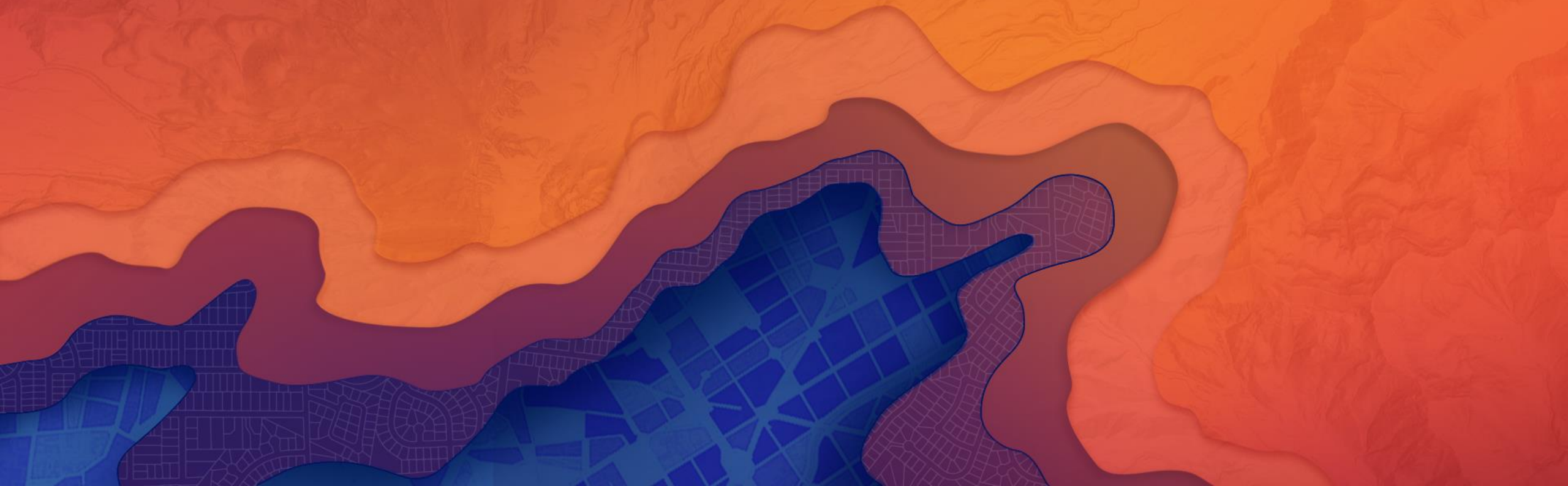
Create a Theme

EMBRACE YOUR OWN STYLE



Community

For you and by you



Documentation

Online help documentation

<http://doc.arcgis.com/en/web-appbuilder>

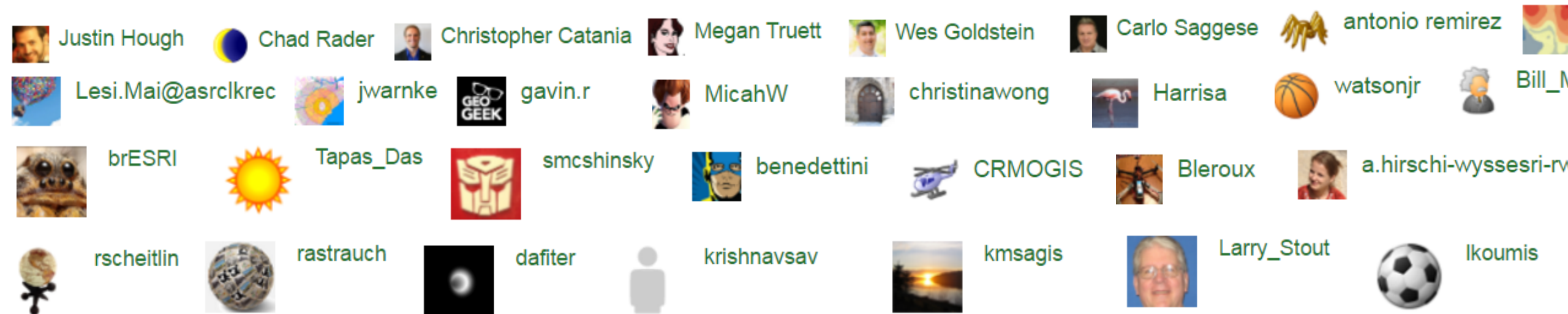
Developer Edition help documentation

<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>



Web Course

Creating Web Applications Using Templates and Web AppBuilder for ArcGIS

🕒 3 Hours

⊕ Wish List

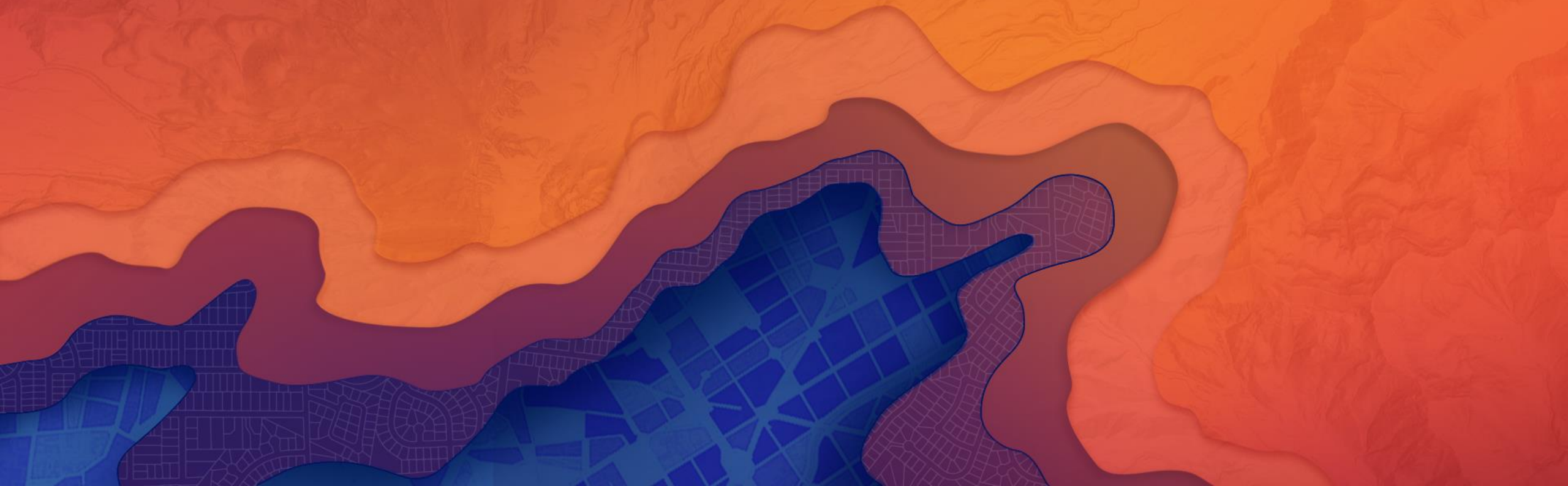
<https://training.esri.com>

Other Online Resources

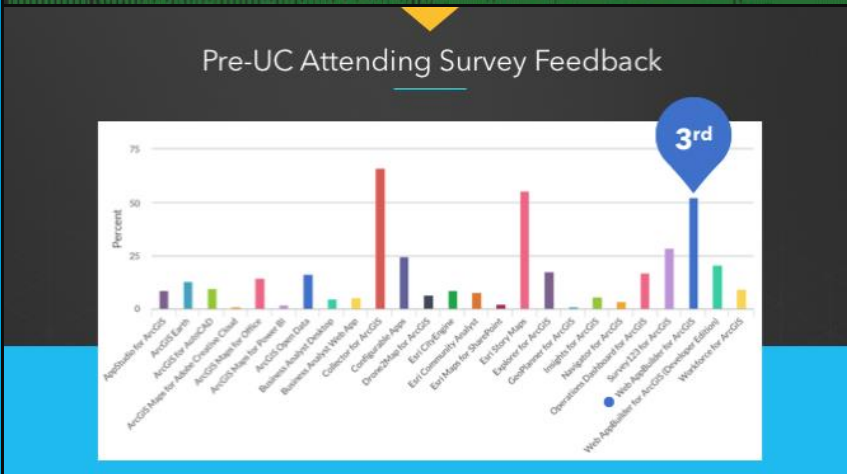
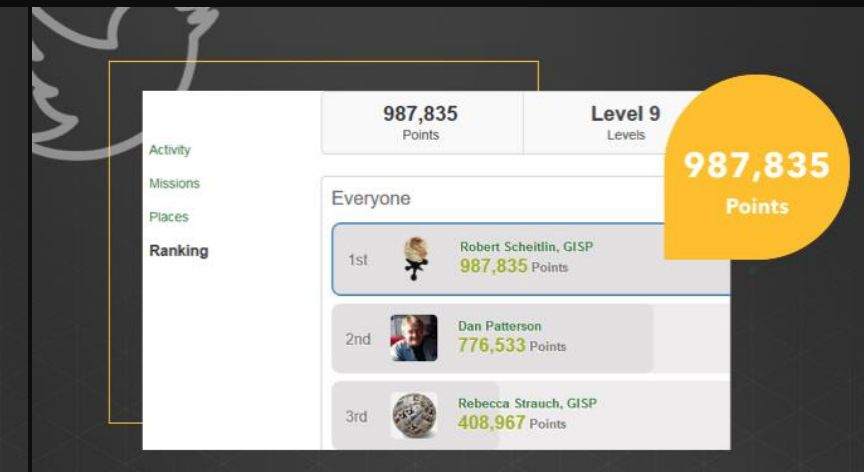
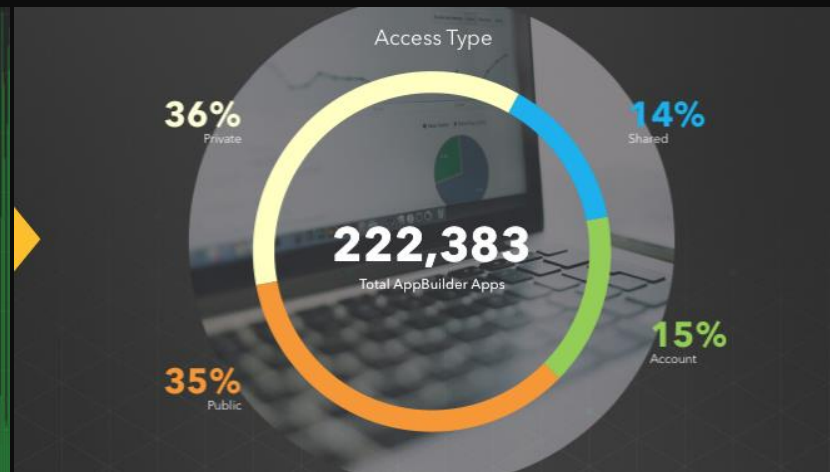
- Esri Solutions Widgets:
 - <https://github.com/Esri/solutions-webappbuilder-widgets>
- Lists of Widgets:
 - <http://codesharing.arcgis.com/>
 - <http://esri-es.github.io/Web-AppBuilder-Custom-Widgets/>
 - <https://github.com/gavinr/wab-widget-search>
- "Awesome ArcGIS" <https://github.com/hhkaos/awesome-arcgis>
- Example widget shown today: <http://esriurl.com/13950>

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...



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

less coding



Limited needs for
grand-up dev works



cheaper
better UX
simpler
faster
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 ...

The image is a composite of two aerial night photographs of a city. The top half features a blue semi-transparent overlay with the text "Experience Builder" in white. The bottom half shows a detailed view of a highway interchange with light trails from vehicles, surrounded by city buildings and streetlights.

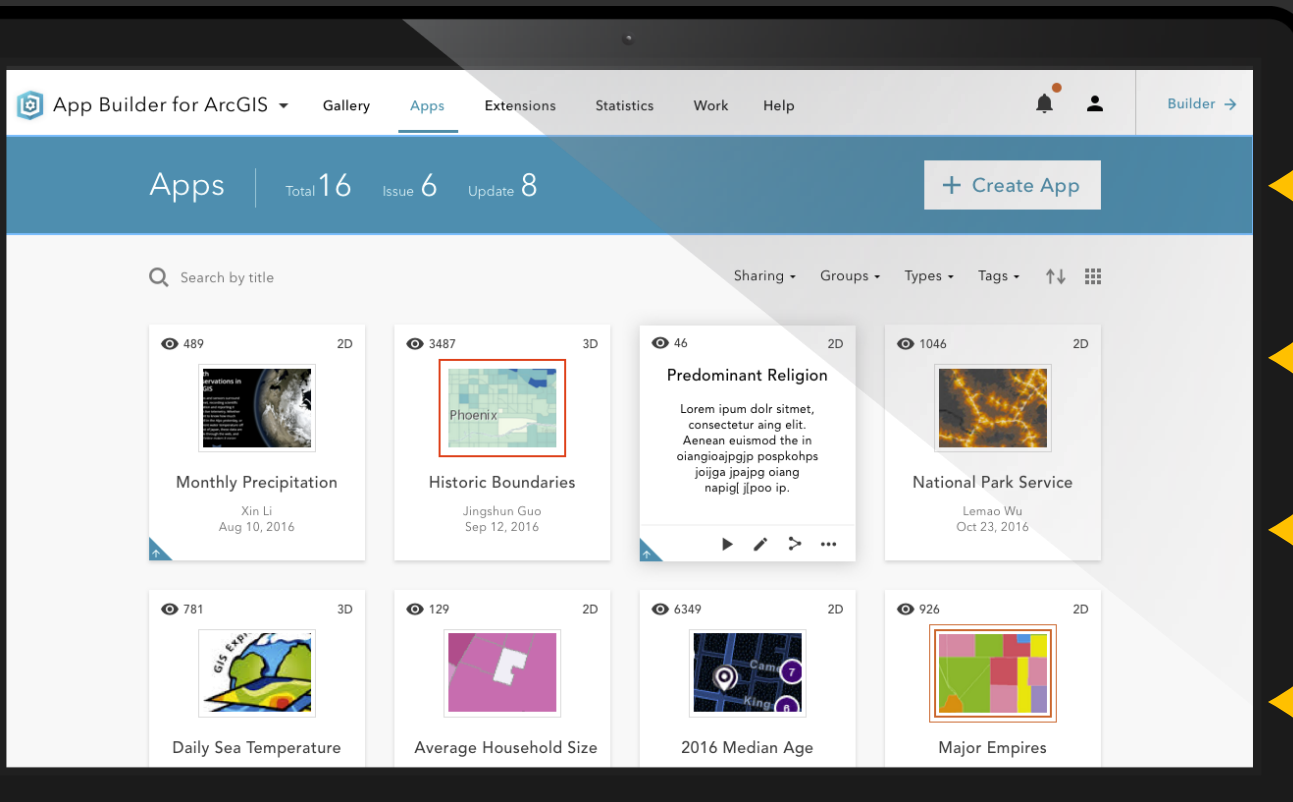
“Experience Builder”

What is Experience 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

for



Configuring and creating apps, mobile applet, pages, etc...



Managing web items such as app's lifecycle



Analyzing and reporting the use pattern of the apps



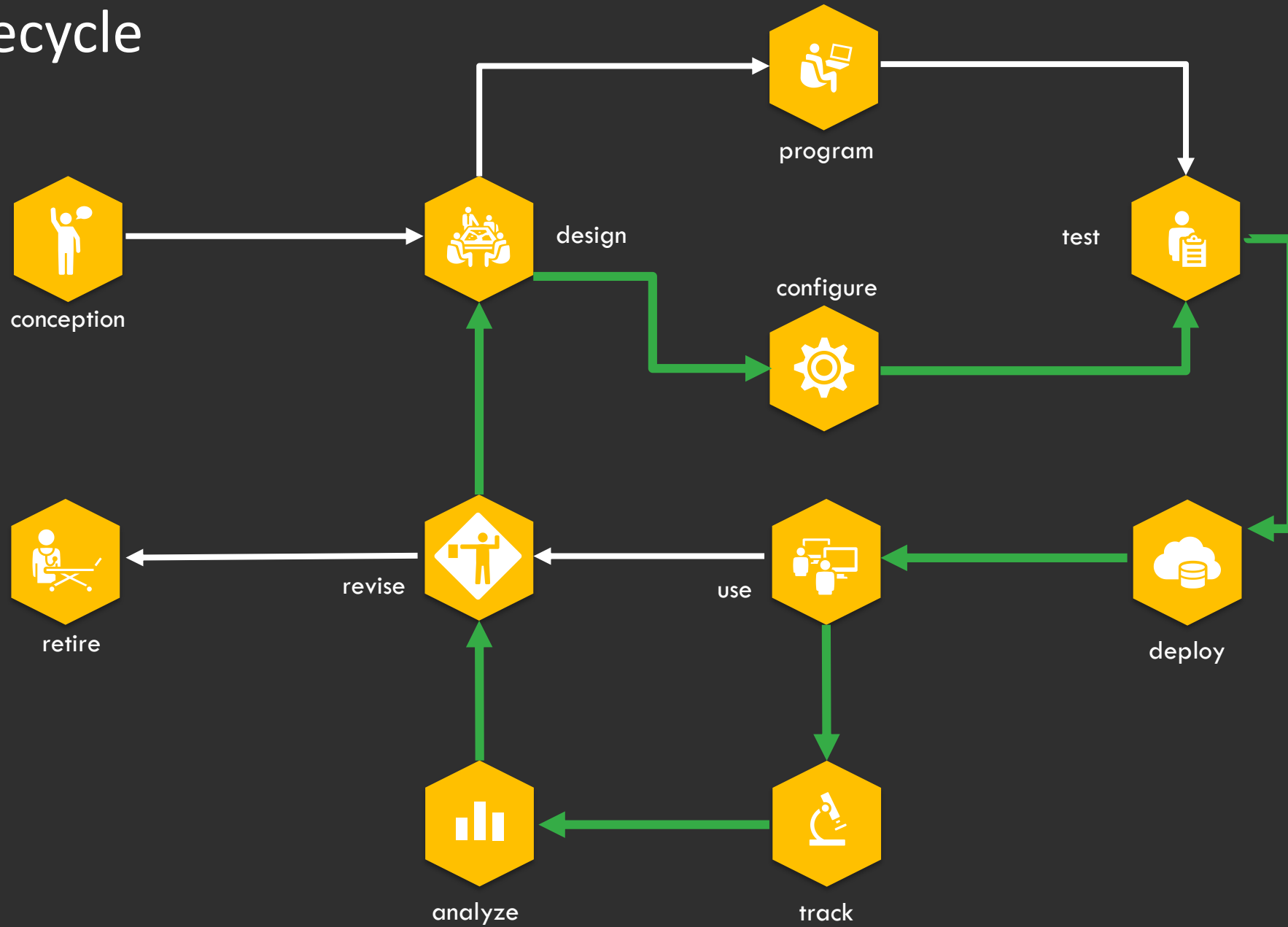
Allowing integration of other app tools

Anatomy of an ArcGIS app

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



App Lifecycle



App Lifecycle is complex

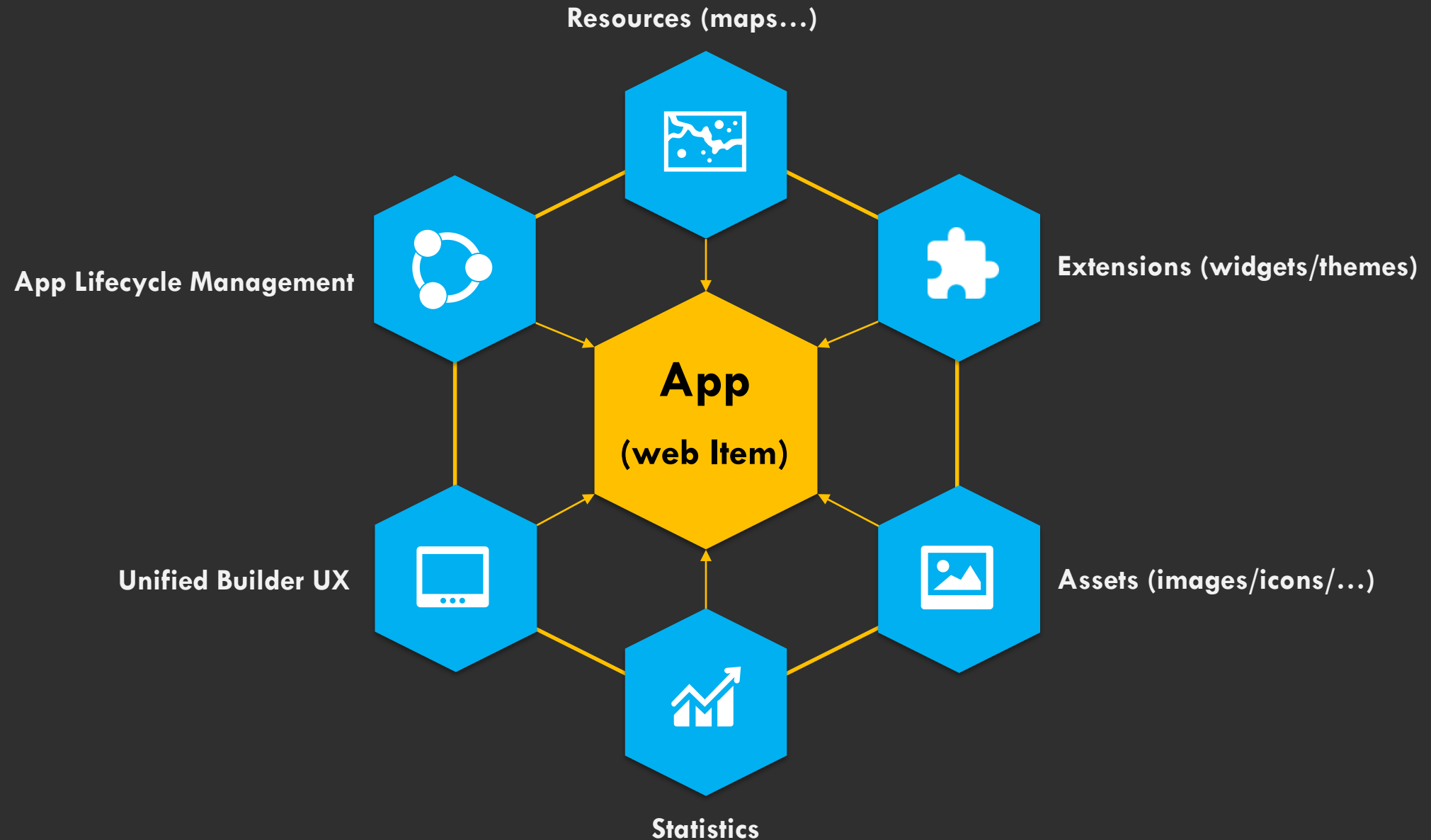
Apps are data

Apps are disposable

**Apps are a conduit to
understand your users**



Experience Builder (app centric)





esri

THE
SCIENCE
OF
WHERE