

Esri Developer Summit

March 8–11, 2016 | Palm Springs, CA



# DECLARATIVE MAPPING APPLICATIONS WITH ANGULARJS

---

Tom Wayson [@tomwayson](https://twitter.com/tomwayson)

Jacob Wasilkowski [@jwasilgeo](https://twitter.com/jwasilgeo)

# Production Ready

## ArcGIS JavaScript API 3.x + Angular 1.x

# Road Ahead

**Angular 1.x & JSAPI 4**

**Angular 2.x & JSAPI 3 & 4**

**ArcGIS API for JavaScript and AngularJS:**

**What's New, What's Next**

**Today 5:30PM Mesquite B**



<declarative />

**{{{data-binding}}}**

# dependency injection

test-all-the-things

A dense, overlapping pile of white Stormtrooper action figures from the Star Wars franchise. The figures are arranged in various orientations, creating a textured, monochromatic background. The lighting is dramatic, with strong highlights on the rounded forms of the troopers' heads and shoulders, and deep shadows in the crevices of their armor plates.

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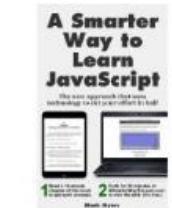
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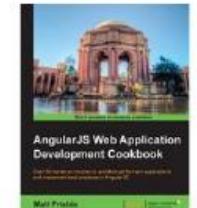
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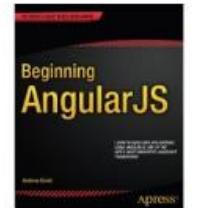
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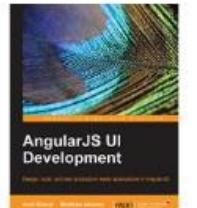
4.58 661

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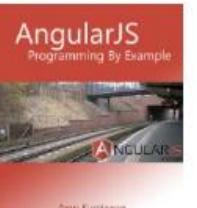
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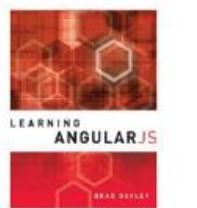
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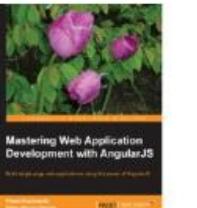
4.58 6

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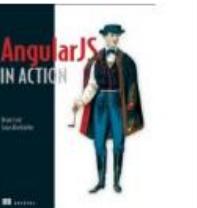
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4.58 9

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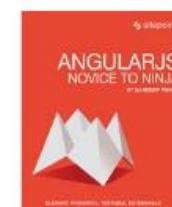


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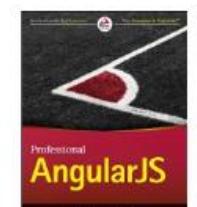
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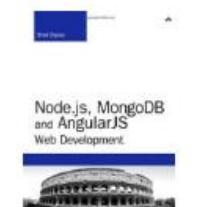
10

AngularJS: Novice to Ninja Oct 9, 2014  
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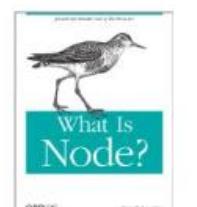
4.58 14

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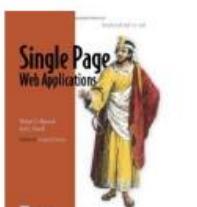
4.58 26

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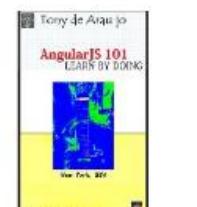
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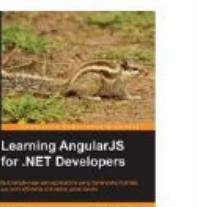
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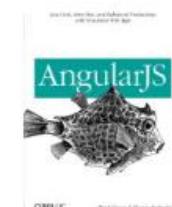
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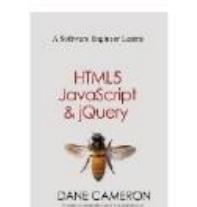
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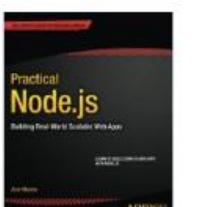
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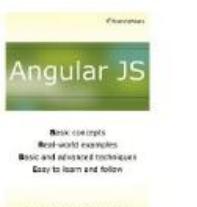
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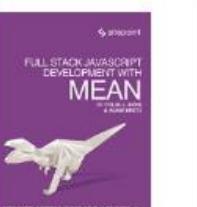
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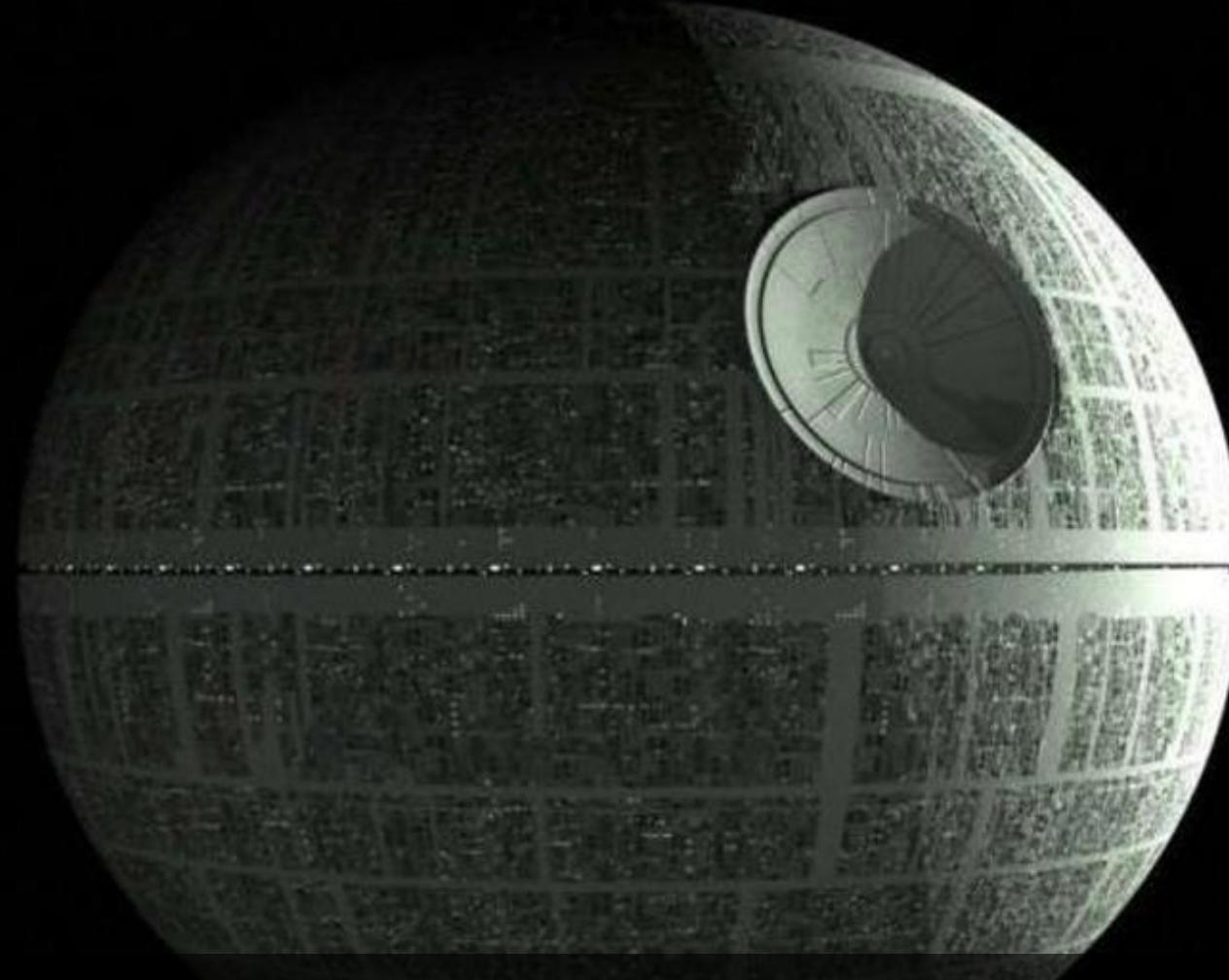
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# big ecosystem





“enterprise”

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First Name(s)

Duck

Surname or Contractor \*

Ranger

Person ID

duck

Address

12 The Esplanade  
Wellington

Email Address

duckranger@duckranger.com

Phone Number

Gender \*

Male



Date of Birth

dd/mm/yyyy

# Forms over data

[Cancel](#)[Save Person](#)



# WebGIS Spatial Economical Clusters in Argentina

## Development Version - Province of Santa Fe

Experimental Geographic Information System (on behalf of [Fundation "Observatorios PyME Regionales"](#)) - more info

### LEGEND

[close](#)

#### ADMINISTRATIVE BOUNDARIES

National Boundary

Province of Santa Fe

#### ZOOM TO LOCATION

ROSARIO

#### COMPANIES - LOCAL UNITS

##### Search Parameters

ISIC CODE (first 2 digits ...) [all](#)

specific Isic code  [info](#)

##### Employment classes' range

From [0](#) to ... [8](#)

##### Search for Company Name

[info](#)

##### Territorial scope of the search

In the current view

All the territory

Province of [all provinces ...](#)

Location of [all locations ...](#)

Marker dim multiply [1](#)

Max Results per query: [500](#)

(better not more than 1500 ...) [info](#)

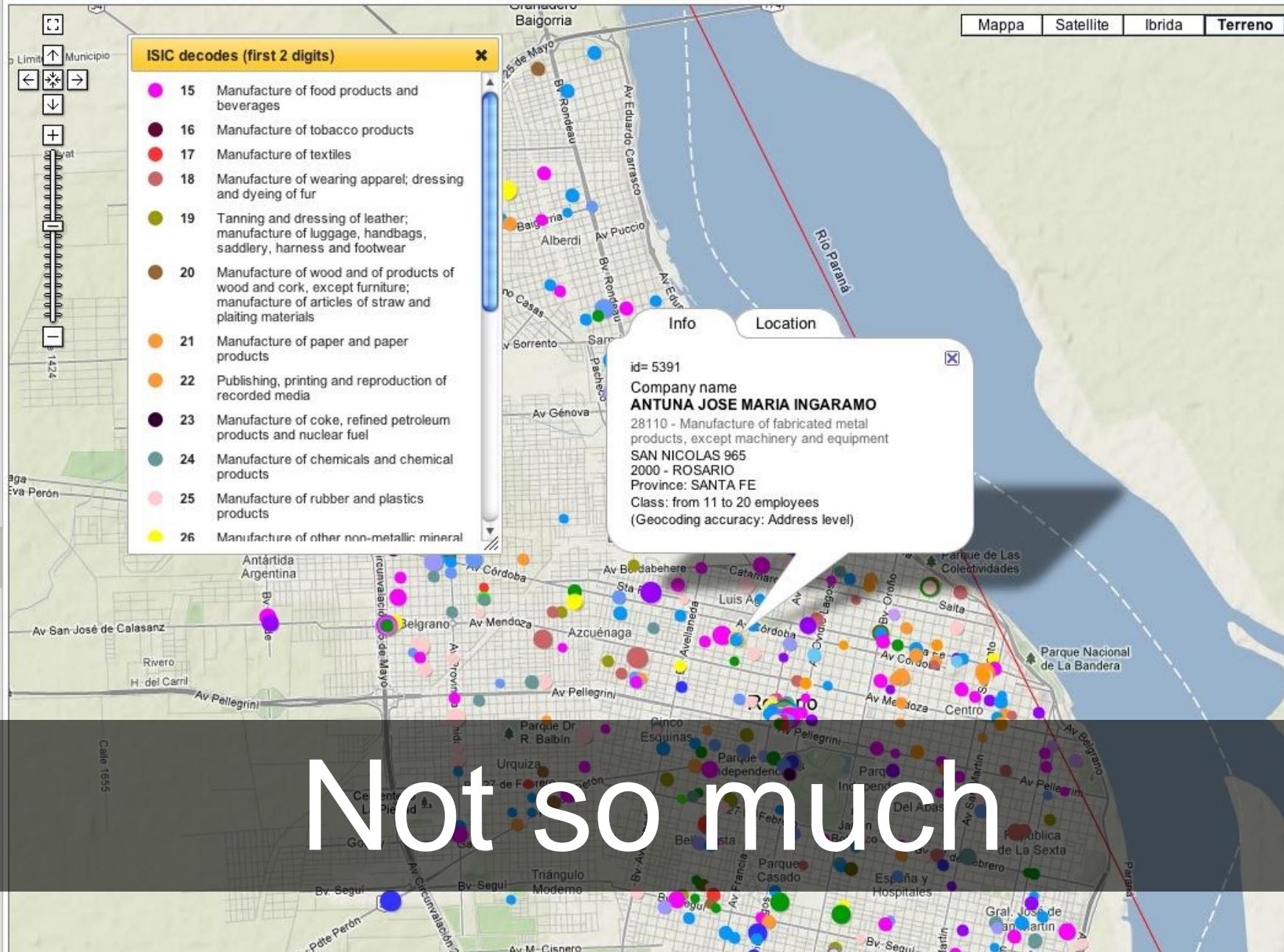
##### Results Ordered by

[employees' class](#) [desc](#)

[Add on the Map](#) [Clean ...](#)

#### CONTENT MANAGEMENT SYSTEM

Access Data Front End - CMS



### SEARCH RESULTS ON THE MAP

**TOTAL RESULTS ON THE MAP: 500**

**LAST SEARCH RESULTS: 500** [info](#)

- [FALCONE BODETTO S.A.](#)

Isic: 33200 - Manufacture of medical, precision and optical instruments, watches and clocks  
 Location: ROSARIO  
 (from 251 to 500 employees ...)

- [SIPAR ACEROS S.A.](#)

Isic: 27100 - Manufacture of basic metals  
 Location: PEREZ  
 (from 251 to 500 employees ...)

- [DANA ARGENTINA S.A.](#)

Isic: 34300 - Manufacture of motor vehicles, trailers and semi-trailers  
 Location: ROSARIO  
 (from 251 to 500 employees ...)

- [MATTIEVICH S.A.](#)

Isic: 15111 - Manufacture of food products and beverages  
 Location: ROSARIO  
 (from 251 to 500 employees ...)

- [SOLIDO S.R.L.](#)

Isic: 18110 - Manufacture of wearing apparel; dressing and dyeing of fur  
 Location: ROSARIO  
 (from 251 to 500 employees ...)

- [CAFES LA VIRGINIA S.A.](#)

Isic: 15491 - Manufacture of food products and beverages  
 Location: ROSARIO  
 (from 251 to 500 employees ...)

- [CAFES LA VIRGINIA S.A.](#)

Isic: 15491 - Manufacture of food products and beverages  
 Location: ROSARIO  
 (from 251 to 500 employees ...)

- [LAVADERO VIRASORO S.A.](#)

Isic: 17120 - Manufacture of textiles  
 Location: ROSARIO  
 (from 101 to 250 employees ...)

- [AMERICANO S.A.](#)

Isic: 17120 - Manufacture of textiles  
 Location: ROSARIO  
 (from 101 to 250 employees ...)

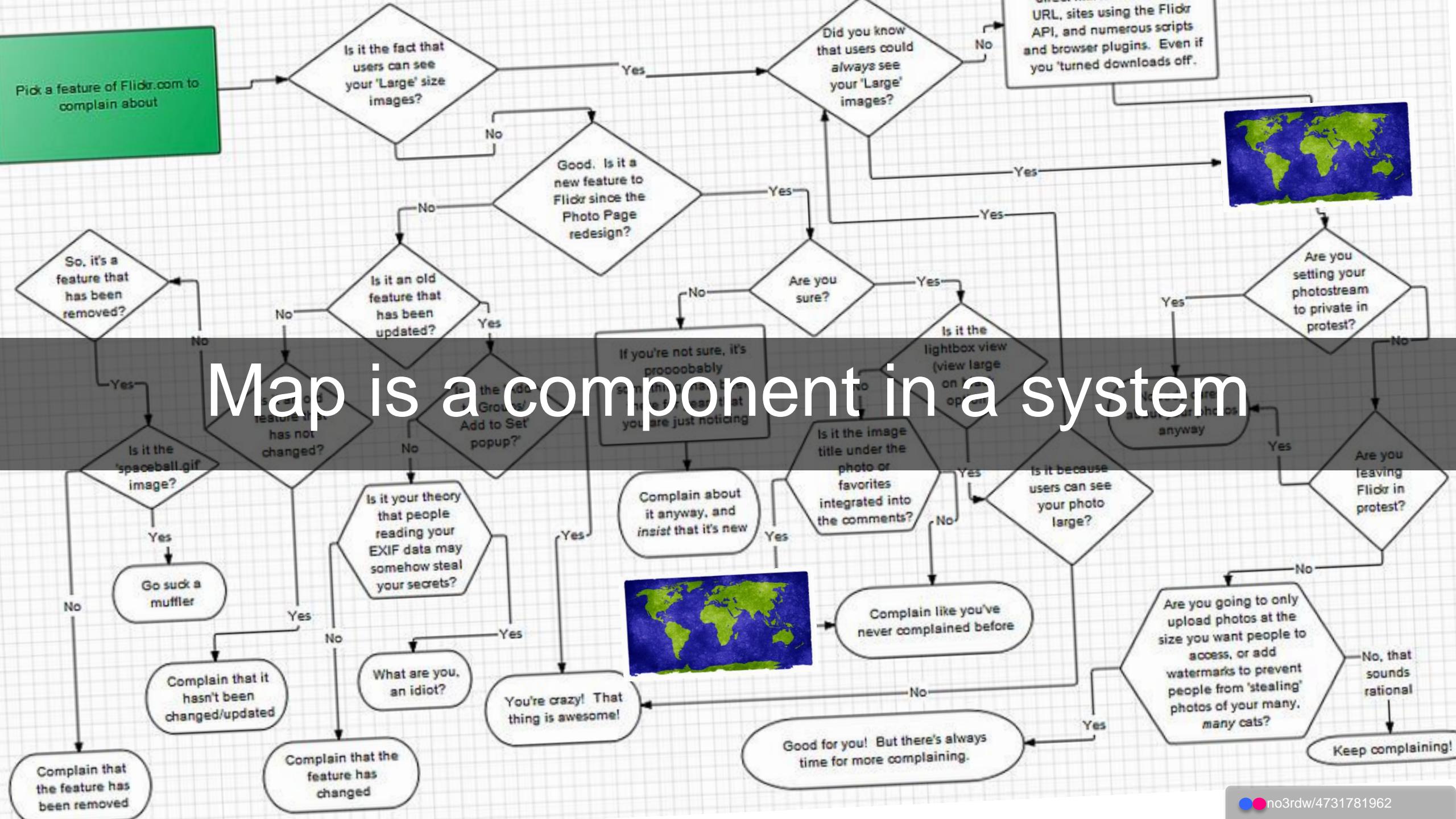
- [EDITORIAL DIARIO LA CAPITAL S.A.](#)

Isic: 22120 - Publishing, printing and reproduction of recorded media  
 Location: ROSARIO  
 (from 101 to 250 employees ...)

- [FRECICAR S.R.L.](#)

Isic: 25201 - Manufacture of rubber and plastics products  
 Location: ROSARIO

# Not so much





**<directive>**

dōjō  
toolkit

<widget>



dojo  
toolkit

Who's in charge?



esri

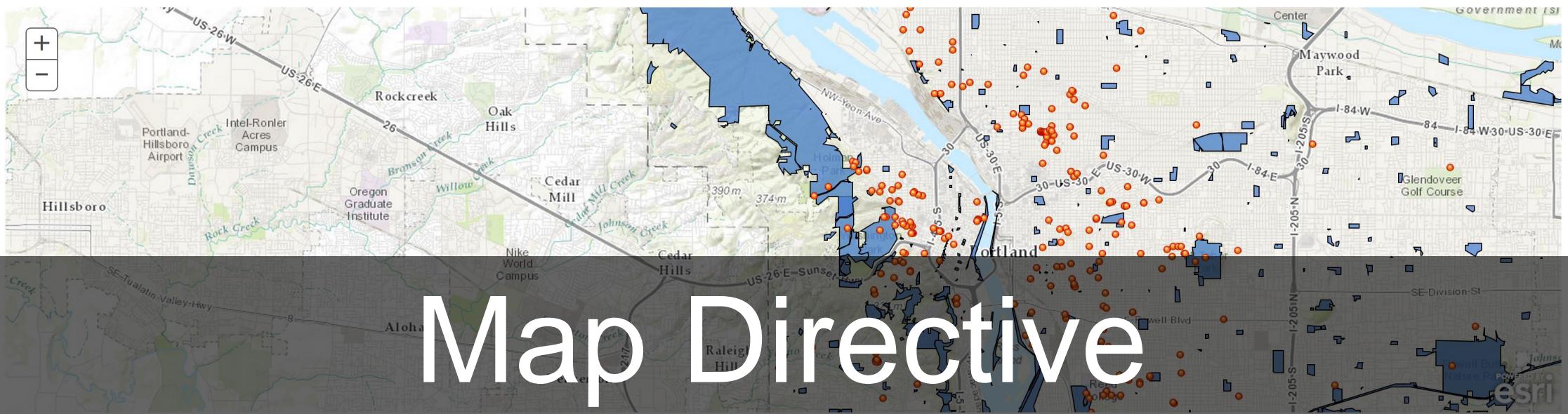


Don't Wrap Angular in Dojo



# Make JSAPI work in Angular

```
<esri-map id="map" center="map.center" zoom="map.zoom" basemap="topo">  
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/0" />  
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/1" />  
</esri-map>
```





Let's go further...

```
<esri-map id="map" center="map.center" zoom="map.zoom" basemap="topo">
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/0" />
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/1">
    <renderer field="area" type="class-breaks">
      <break min="0" max="50">
        <symbol linecolor="#ff0044" fillcolor="#ff0044">
      </break>
      <break min="51" max="150">
        <symbol linecolor="#cc0044" fillcolor="#cc0044">
      </break>
      <break min="151" max="500">
        <symbol linecolor="#aa0044" fillcolor="#aa0044">
      </break>
    </renderer></esri-feature-layer>
  </esri-map>
```

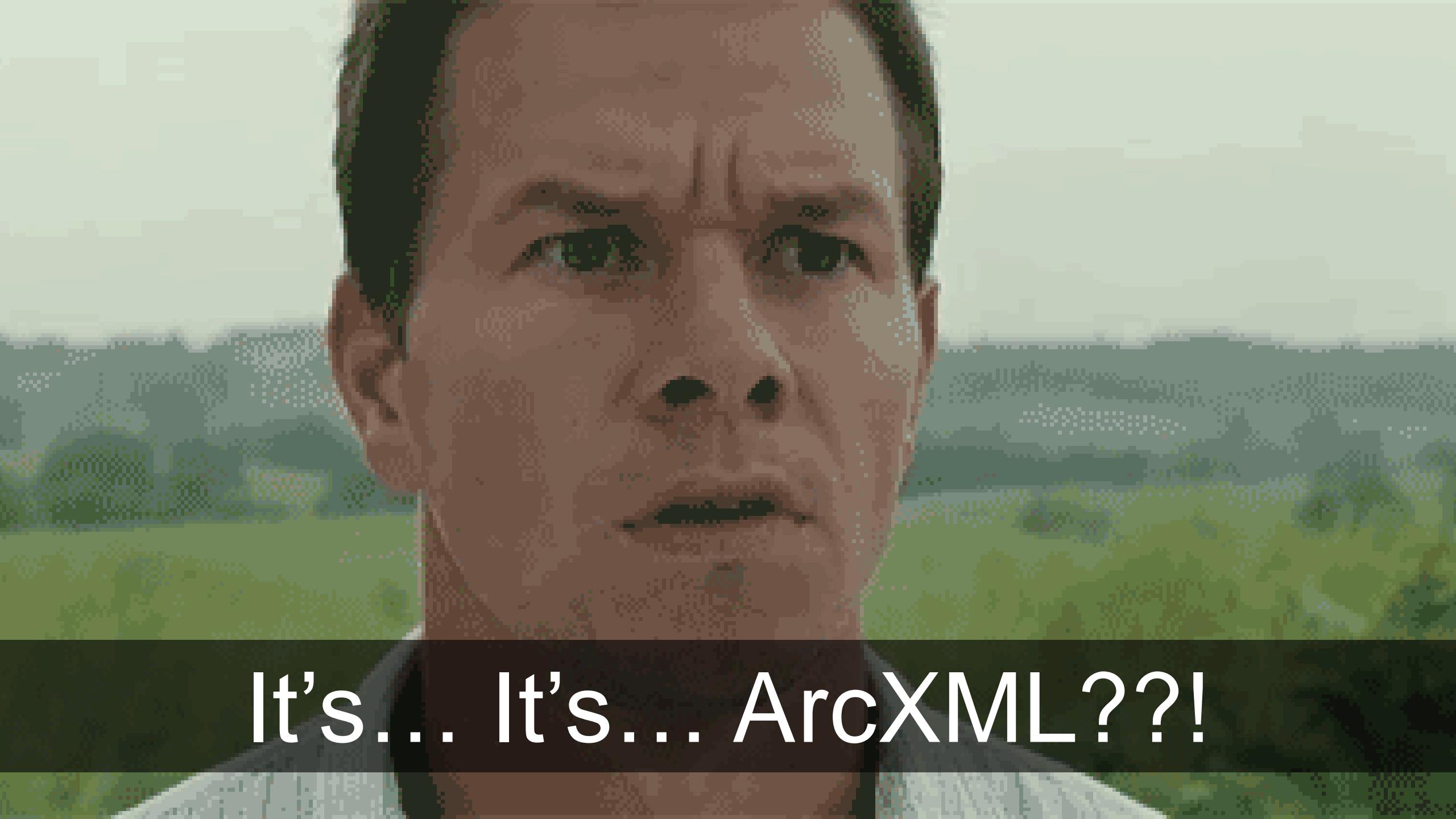
```
<esri-map id="map" center="map.center" zoom="map.zoom" basemap="topo">  
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/0" />  
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/1" />  
  <renderer field="area" type="class-breaks">  
    <break min="0" max="50">  
      <symbol linecolor="#ff0044" fillcolor="#ff0044" />  
    </break>  
    <break min="51" max="150">  
      <symbol linecolor="#cc0044" fillcolor="#cc0044" />  
    </break>  
    <break min="151" max="500">  
      <symbol linecolor="#aa0044" fillcolor="#aa0044" />  
    </break>  
  </renderer></esri-feature-layer>  
</esri-map>
```

25 types of layers

10 renderers

9 types of symbols

100s of events



It's... It's... ArcXML??!

Directives exposing the entire  
Esri JS API?

No.

Directives exposing the entire  
Esri Leaflet API?

No.

A few directives to cover  
common use cases?

Yes!

Facilitate creating custom  
directives?

Yes!



# angular-esri-map

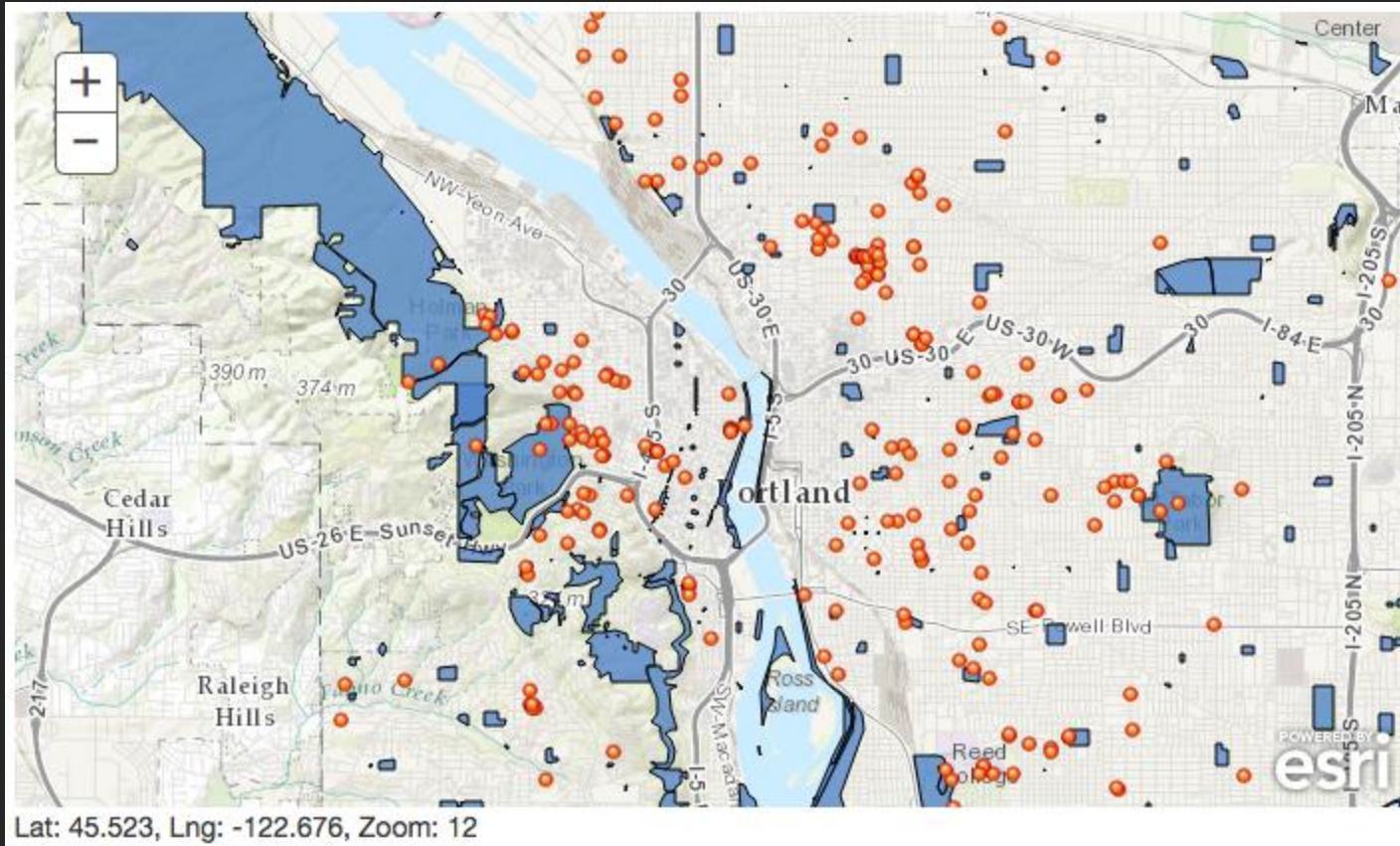
<https://github.com/esri/angular-esri-map>



# Demo

## Quick Start & Brief Tour

# Demo: Quick Start



## Demo: Quick Start

```
<!-- load Esri JSAPI -->
<script src="//js.arcgis.com/3.16compact"></script>
<!-- load AngularJS -->
<script src="//ajax.googleapis.com/ajax/libs/angularjs/1.5.0/angular.js"></script>
<!-- load angular-esri-map -->
<script src="//npmcdn.com/angular-esri-map@1"></script>

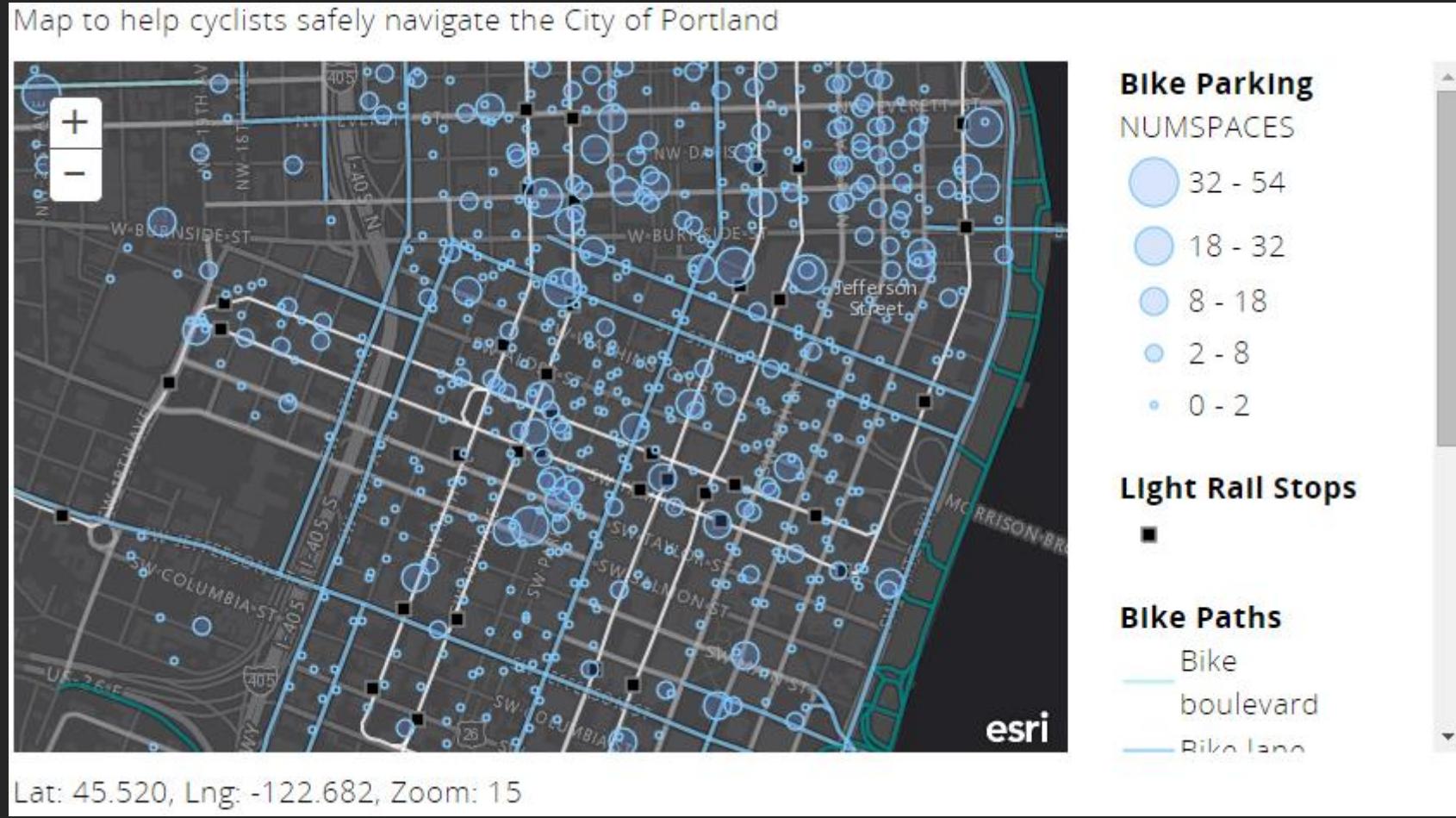
<script type="text/javascript">
  angular.module('app', ['esri.map']);
</script>
```

See the [Quick Start](#)

## Demo: Brief Tour – Set Basemap



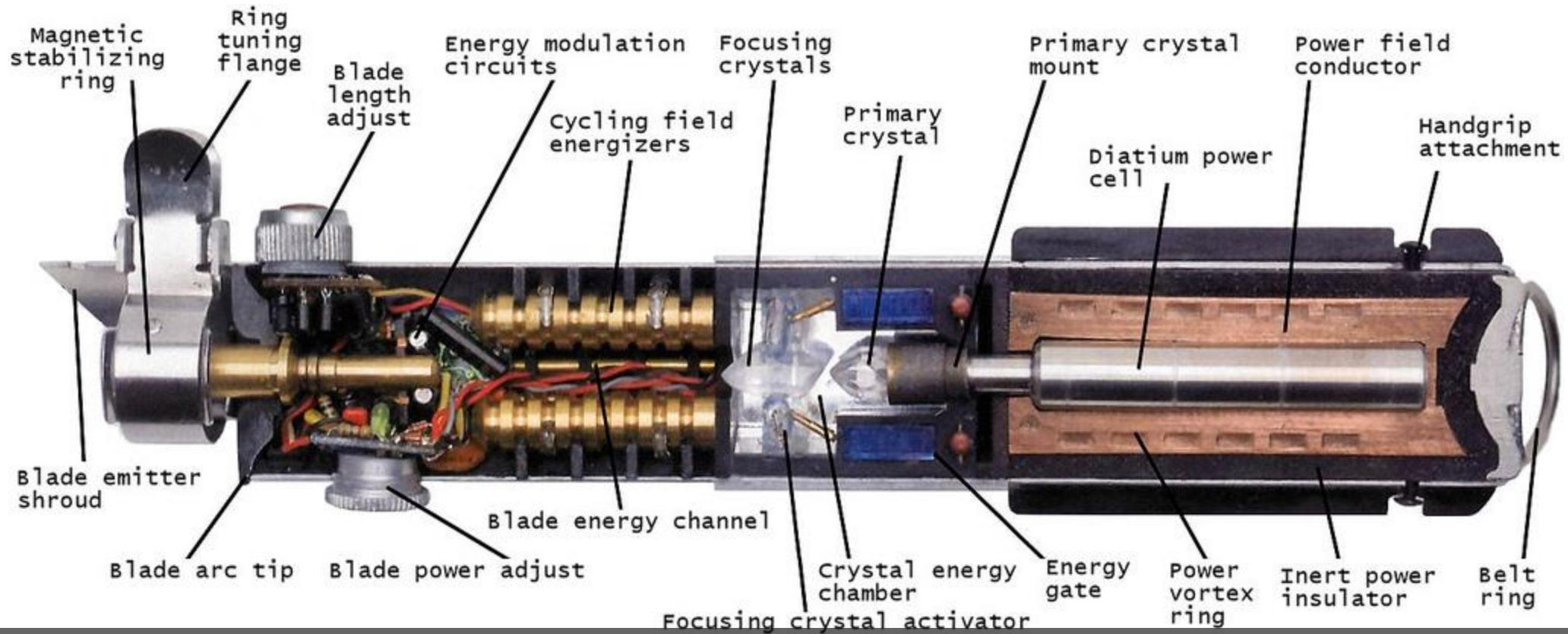
# Demo: Brief Tour – Web Map with Legend





angular-esri-map

DevSummit 2015



# A reference implementation



Create your own map directives

# <parcel-map id="1919377001" />

## Parcel Map

Parcel ID:

1919377001

Select

Clear

### Parcel Details

5415 Provincial Dr  
Bloomfield Hills, MI 48302

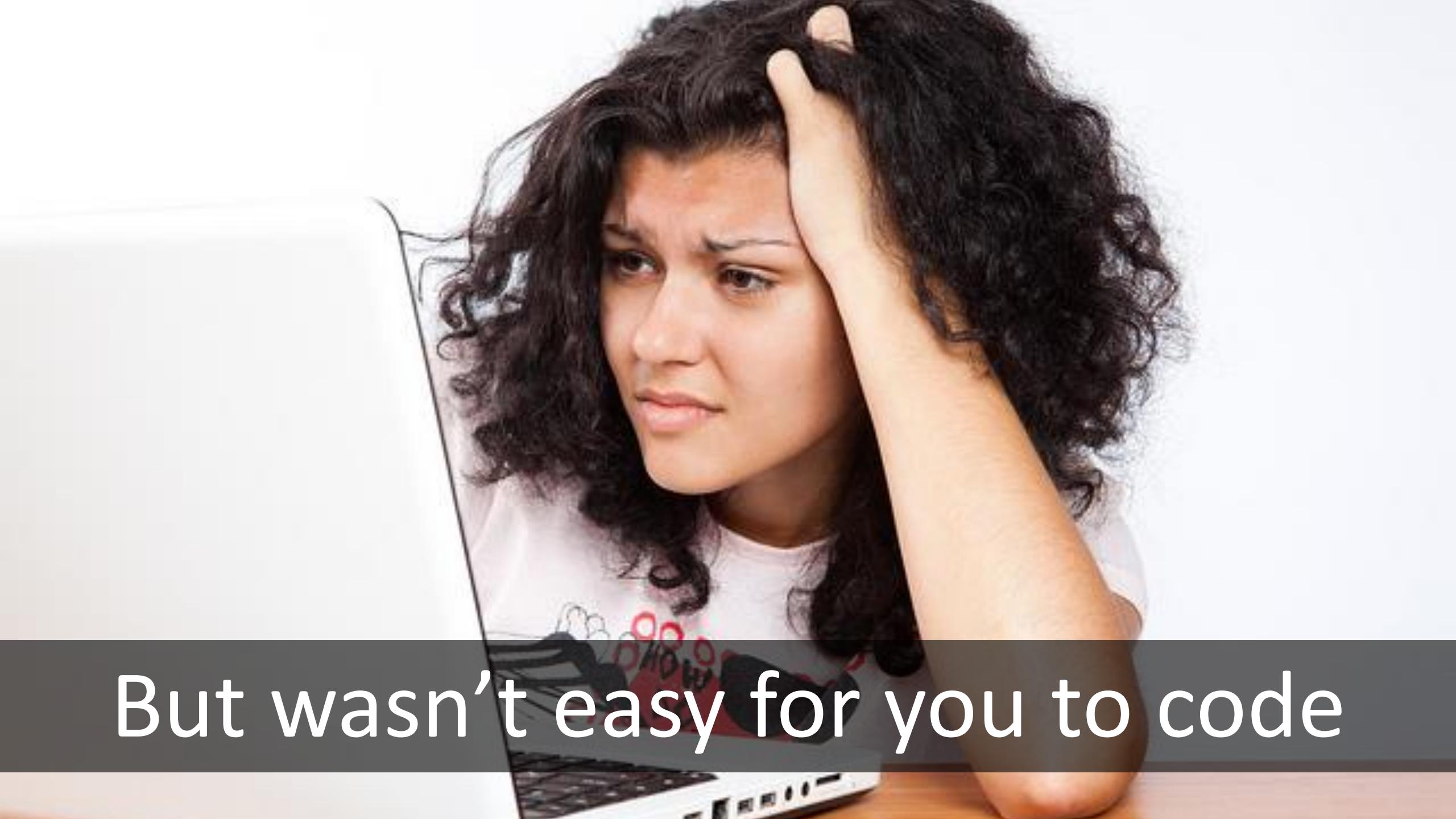
T2N, R10E, SEC 19 BLOOMFIELD  
SQUARE SUB NO 4 LOT 111

Type: Ranch

Built: 1974



# Easy for non-GeoDevs to use



But wasn't easy for you to code



This repository

Search

Pull requests Issues Gist



Esri / angular-esri-map

[Unwatch](#) 45 [Unstar](#) 108 [Fork](#) 66

Code

Issues 10

Pull requests 2

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Filters

is:issue created:&gt;2015-03-13 sort:created-asc la

Labels

Milestones

New issue

[Clear current search query, filters, and sorts](#) 0 Open  28 Closed

Author ▾ Labels ▾ Milestones ▾ Assignee ▾ Sort ▾

[Create new example for additional map attributes](#) enhancement

#41 opened on Apr 1, 2015 by tomwayson

0

[Identify example?](#) enhancement

#44 opened on Apr 9, 2015 by Kollibri

4

[esriLoader should take an array of module names and return an array of modules](#) enhancement

#45 opened on Apr 10, 2015 by tomwayson

1

[Call legend AFTER layers are done loading](#) enhancement

#47 opened on Apr 15, 2015 by Kollibri

5

[Add legend to the web map example](#) enhancement

#75 opened on Aug 27, 2015 by tomwayson 2 of 2

[Update esriMap listeners for continuous map extent information?](#) enhancement

#74 opened on Aug 29, 2015 by jwasilgeo

3

# So most of your feedback said...



“More re-usable directives!”





OK, Let's work together



1) A few more directives & attributes



2) Help you extend & meet your needs

# What's New

Since last we talked

# Added New Layer Types

- `<esri-dynamic-map-service-layer />`
- `<esri-vector-tile-layer />`

# Additional Layer Attributes

- **Visibility**
- **Opacity**
- **Definition Expression (Feature only)**
- **Constructor options**

# Added support for

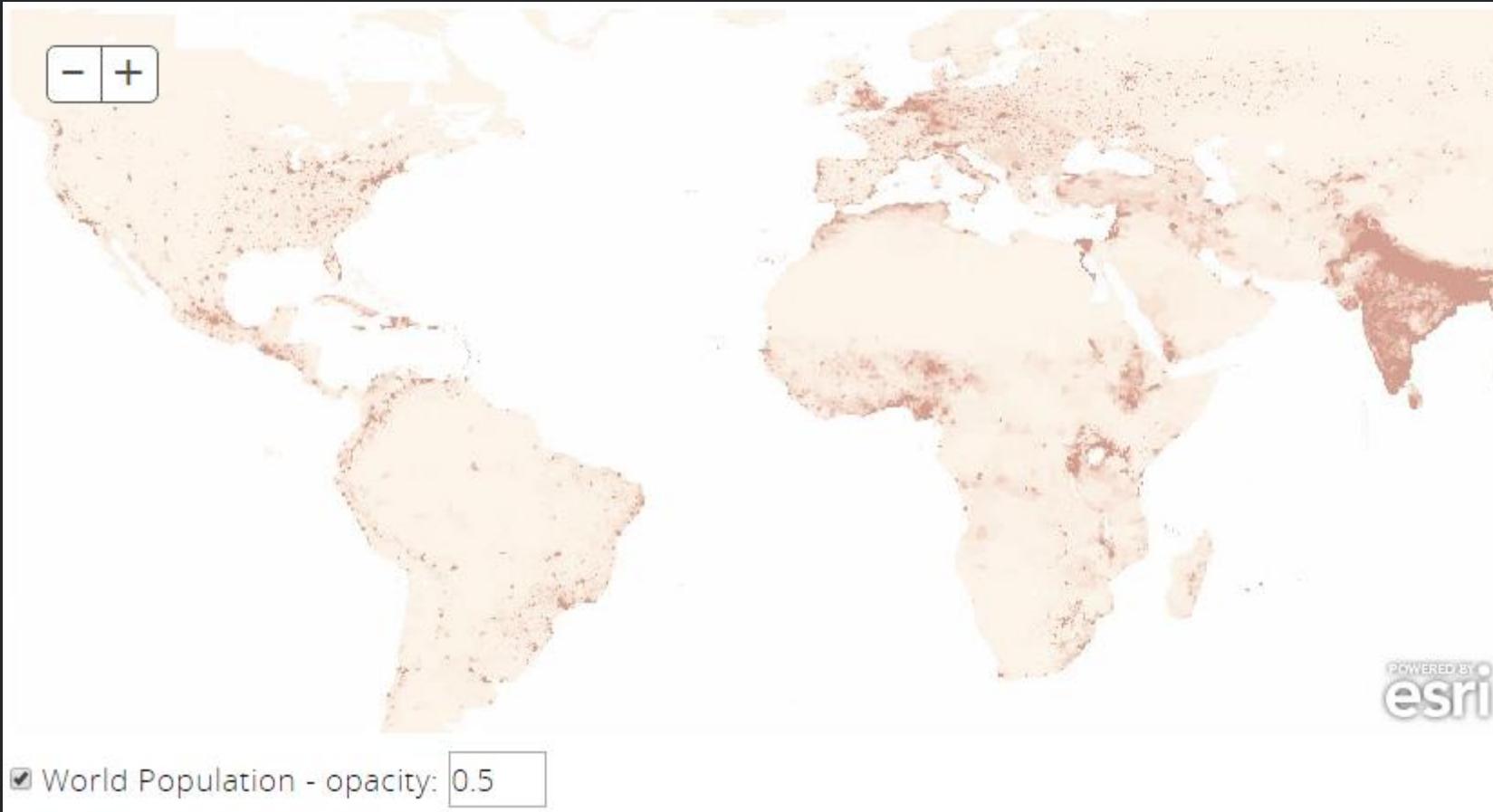
- Info templates
- Typed map constructor options (Extent, etc)
- Add/remove layers after map init



# Demo

## New Directives and Attributes

## Demo: What's New – Dynamic Map Service Layer



# Demo: What's New – Vector Tile Layer





angular-esri-map

DevSummit 2016



Thank you!

Mostly driven by your contributions



2<sup>nd</sup> Goal: Make it easy to extend

# esriLoader Improvements

- Load multiple Esri modules at once
- Promise and callback signatures
- Lazy load ArcGIS JavaScript API

# Refactor out “core” code

- **Refactored shared code into services**
- **Moved services into esri.core module**
- **Ideal for writing your own directives**

# A library you can count on

- **Unit tests for services**
- **e2e tests for directives**
- **Documented public methods/attributes**

# Patterns Pages

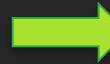
- **Handling map and layer events**
- **Loading additional Esri classes**
- **Creating own custom directives**



# Demo

## Patterns: Extend by example

# Patterns



- Straightforward mapping needs?
  - Use directive property bindings in `esri.map` Angular module

`<esri-map>`

`<esri-feature-layer>`

`<esri-dynamic-map-service-layer>`

`<esri-vector-tile-layer>`

`<esri-legend>`

`<esri-info-template>`

# Patterns

- Straightforward mapping needs?
- Need a little more control?
  - Use callback `load` event binding with `map` (and `layer`) directives
  - And `esriLoader.require()` to get other JSAPI modules

```
<esri-map load="onMapLoad" ...></esri-map>  
  
<script>  
  // in the controller, start once the map is loaded  
  this.onMapLoad = function(map) {  
    // load Esri modules using the esriLoader  
    esriLoader.require([  
      'esri/toolbars/draw',  
      ...  
    ]  
  }  
</script>
```

## Patterns

- Straightforward mapping needs?
- Need a little more control?
  - Use callback `load` event binding with `map` (and `layer`) directives
  - And `esriLoader.require()` to get other JSAPI modules

Demo: [Other Esri Modules](#) example

## Patterns

- Straightforward mapping needs?
- Need a little more control?
- Need even more power?
  - Roll your own map and layer directives
  - Use `esri.core` Angular utilities module with `esriLoader.require()`

```
<parcel-map pin="ABC123"></parcel-map>  
<lot-layout-map lot="93920-A-23"></lot-layout-map>  
<workorder-map order="10-31-14-002"></workorder-map>
```

# Patterns

- Straightforward mapping needs?
- Need a little more control?
- Need even more power?
  - Roll your own map and layer directives
  - Use `esri.core` Angular utilities module with `esriLoader.require()`

```
<housing-map basemap="gray" show-layer="true"></housing-map>
```

```
<esri-point-renderers-map  
  heatmap-renderer-params="heatmapRendererParams"  
  cluster-tolerance="clusterTolerance"  
  renderer-active="{{rendererActive}}>  
</esri-point-renderers-map>
```

# Patterns

- Straightforward mapping needs?
- Need a little more control?
- Need even more power AND want to share mapping state?
  - Use `esriRegistry` to get map reference among controllers

```
<esri-map id="map" register-as="myMap" basemap="topo" ... ></esri-map>
```

```
esriRegistry.get('myMap').then(function(map){  
  map.on('click', function(e) { // do something with click handler }  
  ...  
})
```

See the [Registry Pattern](#) example

# Patterns

- Straightforward mapping needs?
- Need a little more control?
- Need even more power AND want to share mapping state?
  - Suggestion: Todd Motto's [Rethinking AngularJS Controllers](#)
  - Focus on sharing a custom map's state, rather than making reusable directives
  - Make use of your own factory that can be injected among directives, controllers
    - Anything from JSAPI could live in the factory: a map, layers, graphics, etc.
    - Any other directive can then ask the factory for reference



# WebGIS Spatial Economical Clusters in Argentina

## Development Version - Province of Santa Fe

Experimental Geographic Information System (on behalf of [Fundation "Observatorios PyME Regionales"](#)) - more info

### LEGEND

[close](#)

#### ADMINISTRATIVE BOUNDARIES

 National Boundary Province of Santa Fe

#### ZOOM TO LOCATION

[ROSARIO](#)

#### COMPANIES - LOCAL UNITS

##### Search Parameters

**ISIC CODE (first 2 digits ...)** [all](#)specific Isic code  [info](#)

##### Employment classes' range

From [0](#) to ... [8](#)

##### Search for Company Name

 [info](#)

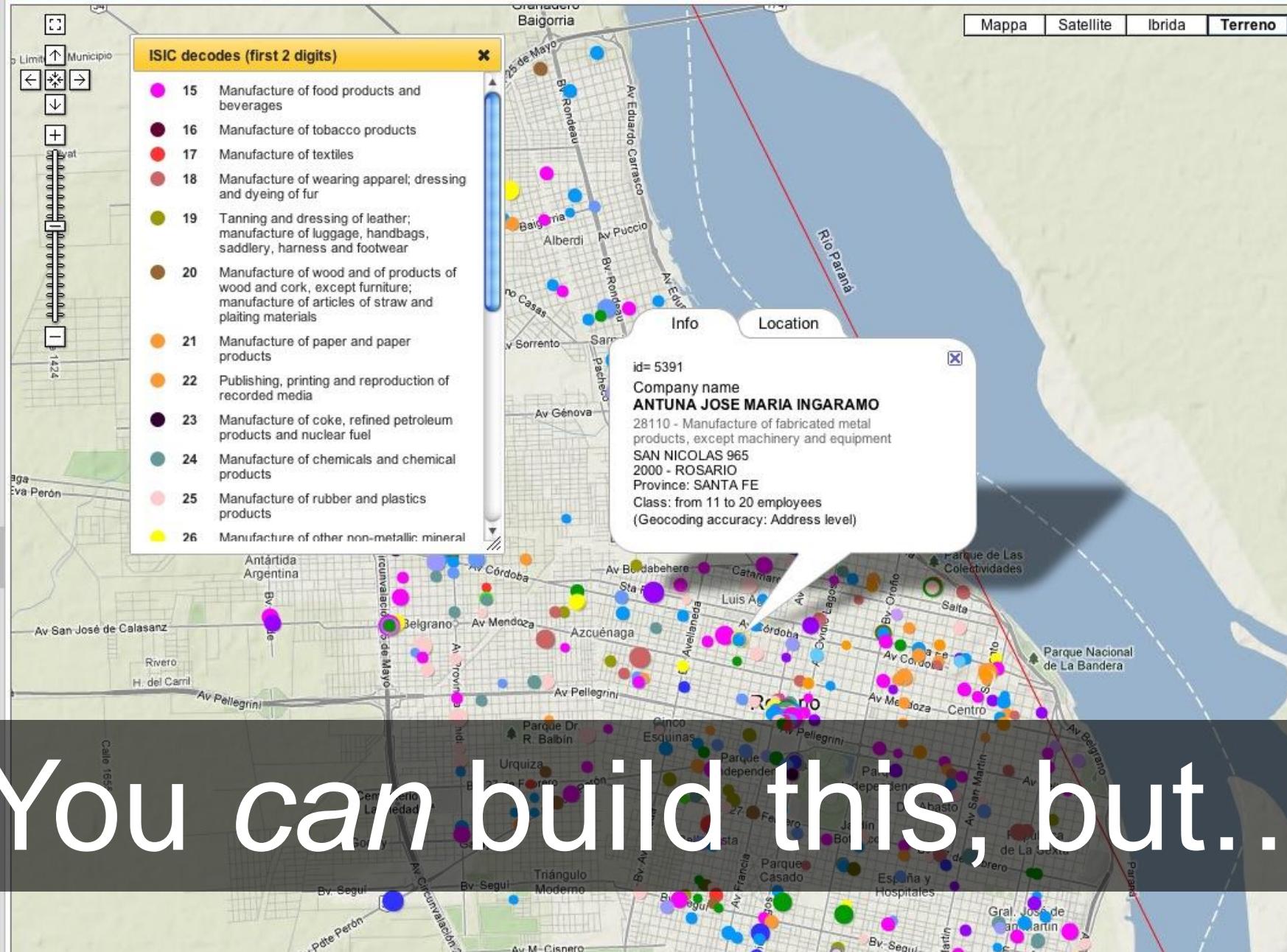
##### Territorial scope of the search

 In the current view All the territoryProvince of [all provinces ...](#)Location of [all locations ...](#)Marker dim multiply [1](#)Max Results per query: [500](#)(better not more than 1500 ...) [info](#)

##### Results Ordered by

[employees' class](#) [desc](#)[Add on the Map](#) [Clean ...](#)

#### CONTENT MANAGEMENT SYSTEM

[Access Data Front End - CMS](#)

### SEARCH RESULTS ON THE MAP

**TOTAL RESULTS ON THE MAP: 500****LAST SEARCH RESULTS: 500** [info](#)

- [FALCONE BODETTO S.A.](#)  
Isic: 33200 - Manufacture of medical, precision and optical instruments, watches and clocks  
Location: ROSARIO  
(from 251 to 500 employees ...)
- [SIPAR ACEROS S.A.](#)  
Isic: 27100 - Manufacture of basic metals  
Location: PEREZ  
(from 251 to 500 employees ...)
- [DANA ARGENTINA S.A.](#)  
Isic: 34300 - Manufacture of motor vehicles, trailers and semi-trailers  
Location: ROSARIO  
(from 251 to 500 employees ...)
- [MATTIEVICH S.A.](#)  
Isic: 15111 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- [SOLIDO S.R.L.](#)  
Isic: 18110 - Manufacture of wearing apparel; dressing and dyeing of fur  
Location: ROSARIO  
(from 251 to 500 employees ...)
- [CAFES LA VIRGINIA S.A.](#)  
Isic: 15491 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- [CAFES LA VIRGINIA S.A.](#)  
Isic: 15491 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- [LAVADERO VIRASORO S.A.](#)  
Isic: 17120 - Manufacture of textiles  
Location: ROSARIO  
(from 101 to 250 employees ...)
- [AMERICANO S.A.](#)  
Isic: 17120 - Manufacture of textiles  
Location: ROSARIO  
(from 101 to 250 employees ...)
- [EDITORIAL DIARIO LA CAPITAL S.A.](#)  
Isic: 22120 - Publishing, printing and reproduction of recorded media  
Location: ROSARIO  
(from 101 to 250 employees ...)
- [FRECICAR S.R.L.](#)  
Isic: 25201 - Manufacture of rubber and plastics products  
Location: ROSARIO

# You can build this, but...

[Basic Details](#)[Job Details](#)[Payment Details](#)[Pay Rates](#)[Tax Details](#)

First Name(s)

Duck

Surname or Contractor \*

Ranger

Person ID

duck

Address

12 The Esplanade  
Wellington

Email Address

duckranger@duckranger.com

Phone Number

Gender \*

Male

Date of Birth

dd/mm/yyyy



# Still the “sweet spot”

[Cancel](#)[Save Person](#)

A wide-angle photograph of a vast savanna landscape. In the foreground, a large herd of wildebeests (gnus) is grazing in a lush green field. The animals are dark brown with prominent, curved horns. The background features a bright blue sky filled with scattered white and grey clouds, creating a sense of depth and movement.

What's the migration path to 4x/2x?



angular-esri-map

For use w/ Angular 1.x only

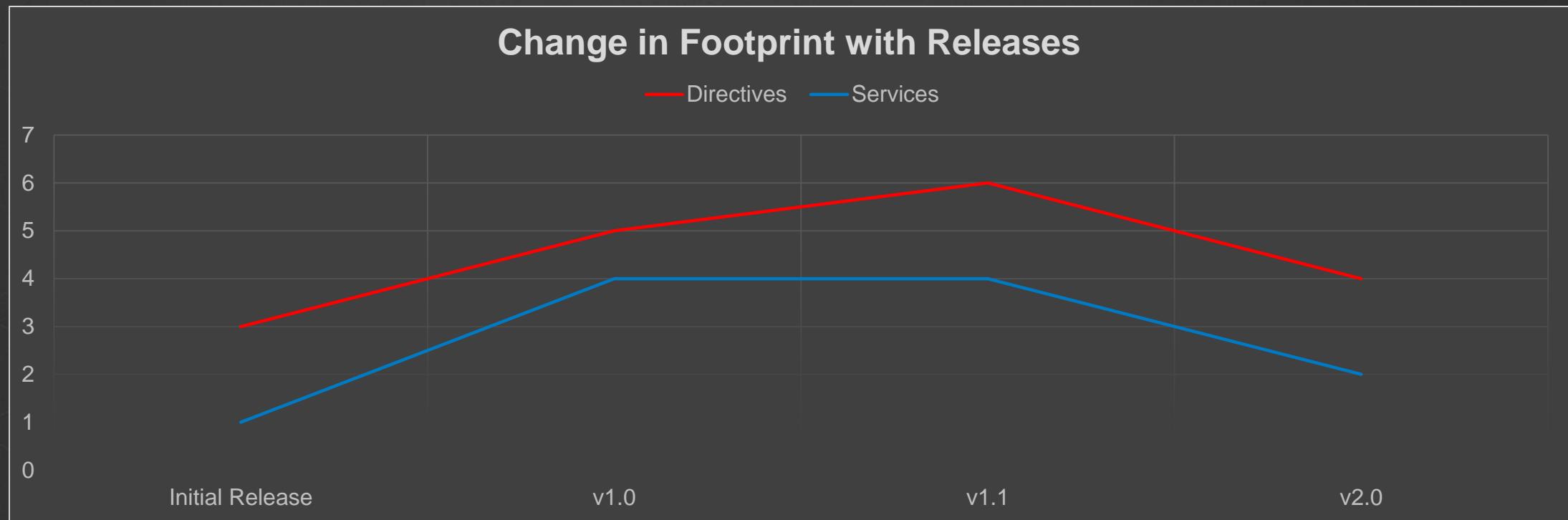
# Version Compatibility

## angular-esri-map

angular-esri-map	Angular	ArcGIS API for JavaScript
v1.0	v1.3+	<u>v3.12+</u>
v1.1	v1.3+	<u>v3.15+</u>
v2.xbeta	v1.3+	<u>v4.0beta3+</u>

# Decreasing Footprint of angular-esri-map

As Angular and ArcGIS API for JavaScript become more compatible



# JSAPI 4.x with Angular 1.x

- JSAPI 4.x has breaking changes
- angular-esri-map 2.x has breaking changes

# The Good News

- Services are unchanged
- Patterns are unchanged, and become more important

# The Not So Good News

- **Directives are completely different**
- **Only include directives for objects that have a UI footprint**

# A Better Dev Experience

- No need learn new declarative API
- Write code in a familiar style



What about Angular 2?

# Even Smaller Surface

- **May not need reusable components**
- **Still figuring out the patterns**

# Follow Along at Home

## Angular 2 Integration Patterns

- [odoe/esrijs4-vm-angular2](#)

JSAPI 4 + Angular 2: Focus on view models

- [tomwayson/angular2-esri-example](#)

Example Angular 2 app using JSAPI 3

- [jwasilgeo/angular2-esri-playground](#)

Deeper dive into JSAPI 4 + Angular 2

# Road Ahead

**Angular 1.x & JSAPI 4**

**Angular 2.x & JSAPI 3 & 4**

**ArcGIS API for JavaScript and AngularJS:**

**What's New, What's Next**

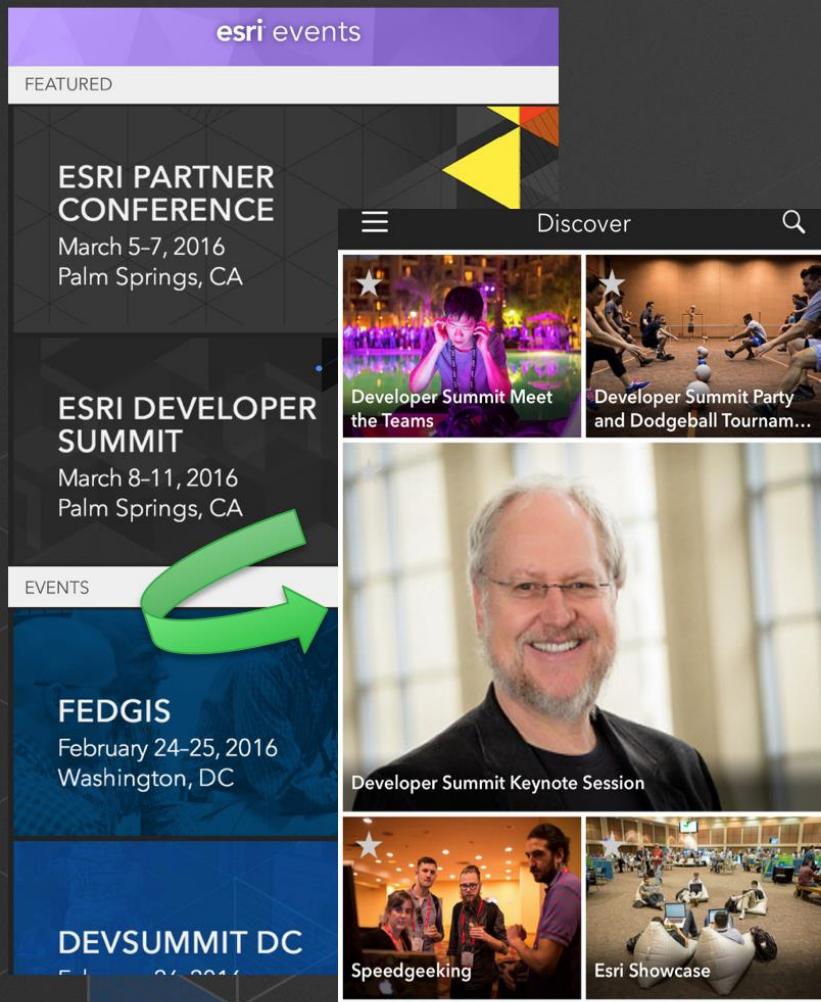
**Today 5:30PM Mesquite B**

# Thank You

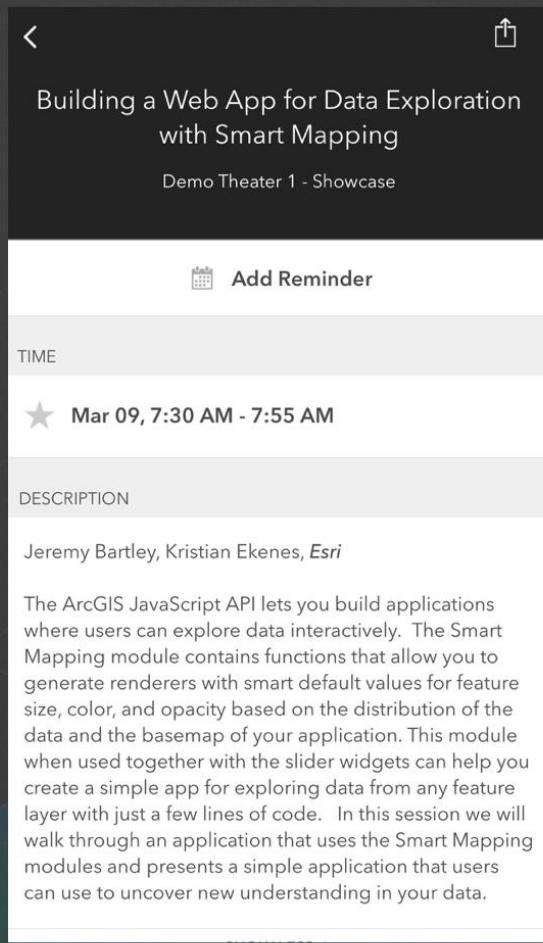
Tom Wayson [@tomwayson](https://twitter.com/tomwayson) | Jacob Wasilkowski [@jwasilgeo](https://twitter.com/jwasilgeo)

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Select the session you attended



Scroll down to the “Feedback” section

Building a Web App for Data...

FEEDBACK

\* = Required

Title and Level of the workshop were consistent with the Content (\*)

Content of the workshop was relevant to my work (\*)

The workshop provided information or techniques I can apply to my work right away (\*)

I would recommend this workshop to a colleague (\*)

The presentation was organize and easy to understand (\*)

The presenter exhibited strong public speaking skills (\*)

Comments (\*)

Low 1 2 3 4 5 High

Yes No

Submit

Complete Answers, add a Comment, and Select “Submit”

