

esri

Getting Started with Web Development and the ArcGIS API for JavaScript

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DEVELOPER SUMMIT



Presentations accessible via GitHub

👉 Slides & demos: <https://bit.ly/3rDUUdQ> 👈

Agenda

- Setup
- First steps
- API keys
- Working with layers
- Widgets
- Symbols and renderers
- Client-side filtering
- Widgets Part 2 (FeatureTable)

Where do I begin?

Find page...

Overview

Key features

Get started

Install and set up

Release notes

FAQ

Community

Tutorials

Core concepts

Data visualization

Building your UI

Working with ArcGIS
Online and Enterprise

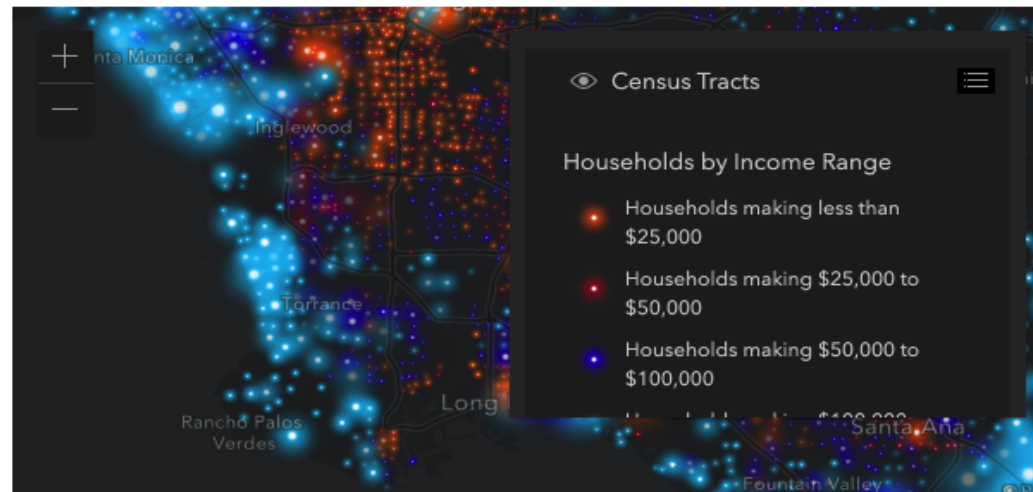
Developer tooling

Migrating from 3.x

Overview

Current version: 4.18 December 2020. [Release notes](#).

This guide describes how to use ArcGIS API for JavaScript to build compelling web apps that unlock your data's potential with interactive user experiences and stunning 2D and 3D visualizations.



Overview

Where to start

Sample code

Showcase

Tutorials

Blog

Was this page helpful?

Yes No

Heather Gonzago



Developer Setup

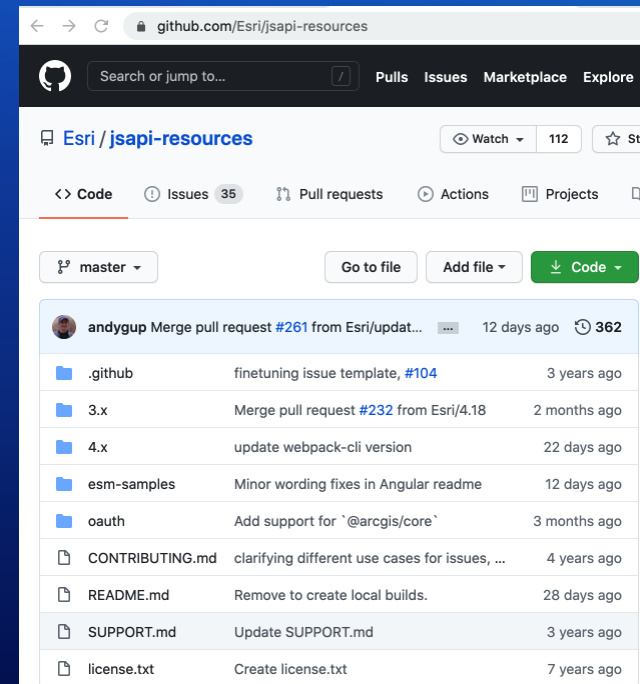


ATOM

Visual Studio Code

JSAPI Resources

- Includes
 - JSHint file
 - TypeScript definition file
 - Build tools (Webpack, npm)
 - Working with frameworks



Get the API

- CDN - Custom builds - Download builds



```
<link rel="stylesheet"  
href="https://js.arcgis.com/4.18/esri/themes/light/main.css" />  
<script src="https://js.arcgis.com/4.18/"></script>
```


CSS

Themes and styling



```
<link rel="stylesheet"  
href="https://js.arcgis.com/4.18/esri/css/main.css">
```

Custom CSS (SASS)



```
<link rel="stylesheet"  
href="https://js.arcgis.com/4.18/esri/css/view.css">
```

Jose Banuelos



First steps

- How will your app be written?
- Separate files or one combined file?

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8" />
    <meta
      name="viewport"
      content="initial-scale=1,maximum-scale=1,user-scalable=no"
    />

    <title>
      Black-Owned Business Tracker
    </title>

    <link
      rel="stylesheet"
      href="https://js.arcgis.com/4.18/esri/themes/dark-red/main.css"
    />
    <link rel="stylesheet" href="css/main.css" />
    <script src="https://js.arcgis.com/4.18/*"></script>
    <script src="js/main.js"></script>
  </head>

  <body>
    <div id="viewDiv"></div>
  </body>
</html>
```

MapView

Visualize data within Map or Scene

```
const map = new Map({  
  basemap: "gray-vector"  
});
```

```
const view = new MapView({  
  container: "viewDiv",  
  map: map,  
  zoom: 12,  
  center: [-117.168, 32.77]  
});
```

```
const view = new SceneView({  
  container: "viewDiv",  
  map: map,  
  camera: {  
    heading: 210,  
    tilt: 78,  
    position: {  
      x: -8249335,  
      y: 4832005,  
      z: 50.7,  
      spatialReference: {  
        wkid: 3857  
      }  
    }  
  }  
});
```


API Keys

- For use with Basemaps and Location services

The screenshot shows the ArcGIS Developers API Keys dashboard. At the top, there is a navigation bar with the ArcGIS Developers logo, a search bar, and a user profile icon. Below the navigation bar, the page title is "Dashboard / API keys". A prominent purple button labeled "+ New API Key" is on the left, next to a search bar. A note below the search bar states: "Note: Use API keys to access [location services](#) and premium content in your applications. Learn more about using [API keys](#) to access services in the [ArcGIS Developer Guide](#)." Below the note, a table lists API keys. The first key is named "my_key", modified 12 days ago, and has options to "View Usage", "Edit API Key", and "Delete API Key". The key value is "Aef342aeb1ah452klatDDx343BdfAn-eeeeS2999190111fdsYgletaAb2309ty". Below the key value, there are two sections: "Services" and "Allowed Referrers". Under "Services", "Basemaps" is selected. Under "Allowed Referrers", the value is "https://*.domain.com".

developers.arcgis.com/api-keys

ArcGIS Developers

Search

Dashboard / API keys

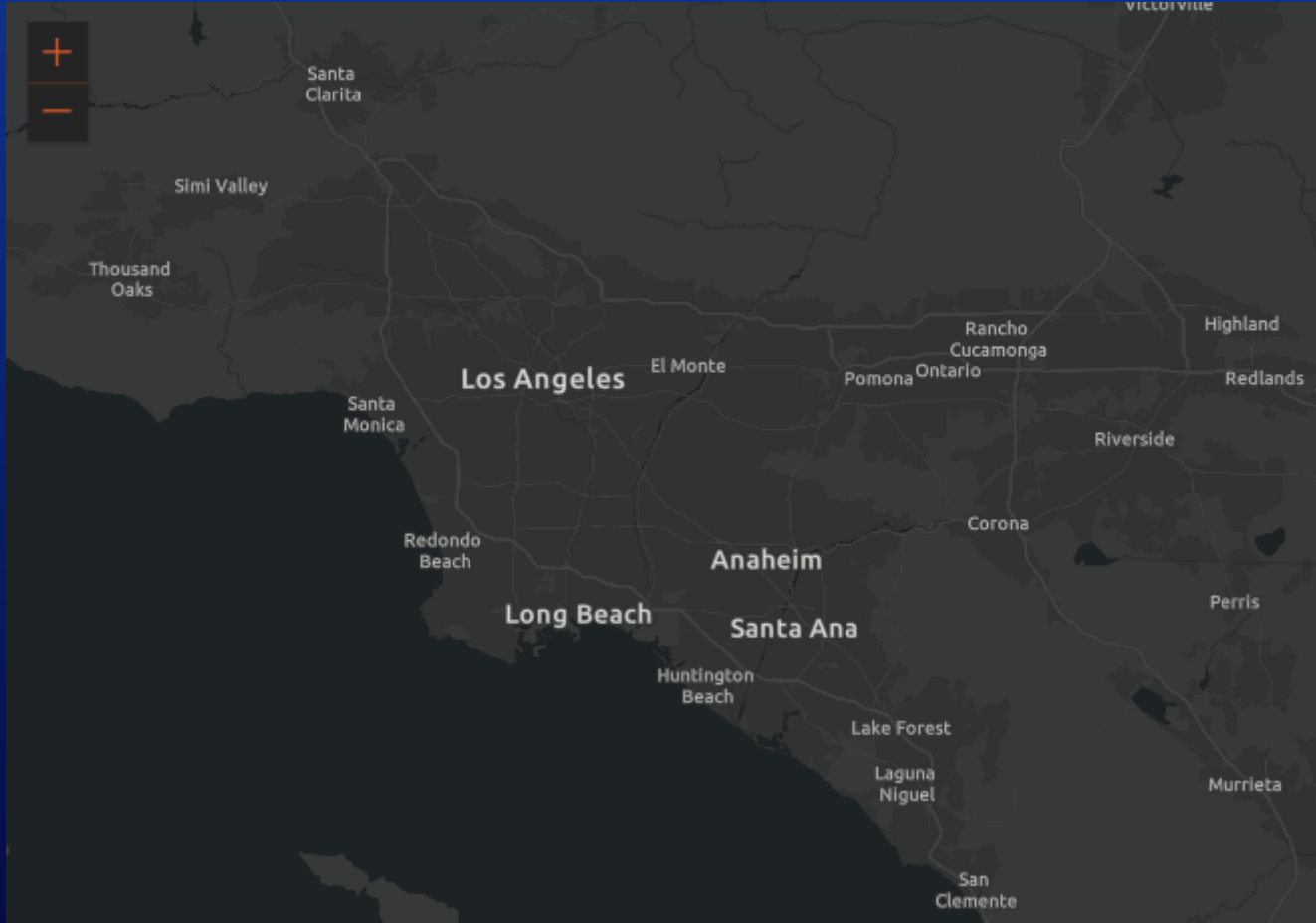
+ New API Key

Search

Note: Use API keys to access [location services](#) and premium content in your applications. Learn more about using [API keys](#) to access services in the [ArcGIS Developer Guide](#).

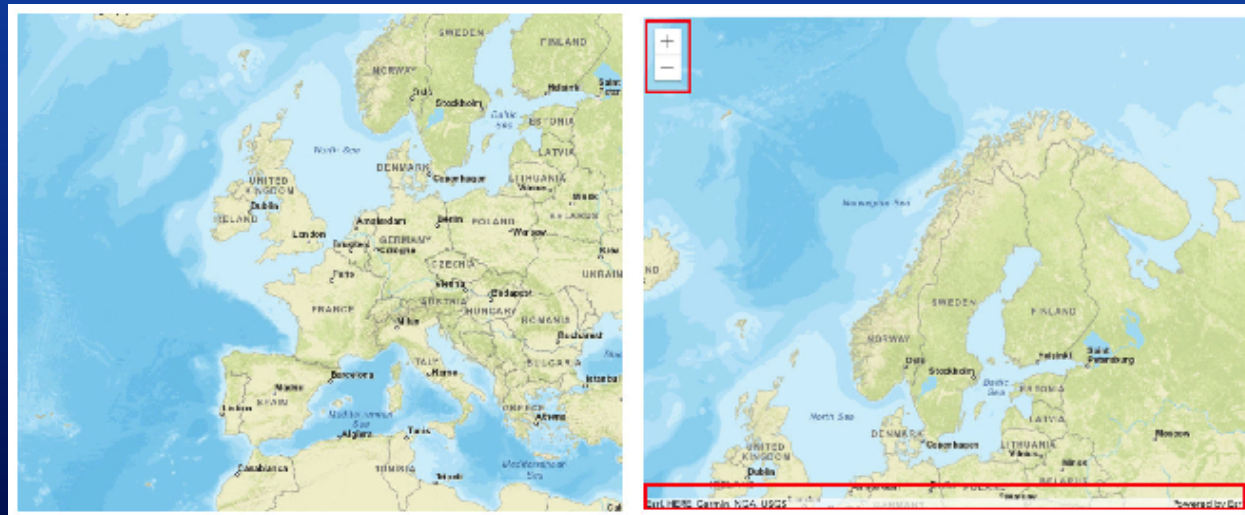
☆ my_key		🕒 Modified 12 days ago	📊 View Usage	✎ Edit API Key
			🗑 Delete API Key	
Aef342aeb1ah452klatDDx343BdfAn-eeeeS2999190111fdsYgletaAb2309ty				
Services		Allowed Referrers		
Basemaps		https://*.domain.com		

Demo: Create a Map with an API- Key basemap



Common Gotchas

- Module order makes a difference
- Missing module
- Missing CSS



Add layers

Various layer types



```
require(["esri/layers/FeatureLayer"], function (FeatureLayer) {  
    // points to the states layer in a service storing U.S. census  
    var fl = new FeatureLayer({  
        url: "https://sampleserver6.arcgisonline.com/arcgis/rest/se  
    });  
    map.add(fl); // adds the layer to the map  
});
```

1. Load module
2. Create layers
3. Set properties
4. Add to map or scene

- Basic steps remain the same



Properties

- No need for a bunch of get/set statements

```
const map = new Map();
map.basemap = "streets";
const view = new MapView();
view.center = [-100, 40];
view.zoom = 6;
```

- Properties can be set in constructor

```
const map = new Map({
  basemap: "streets"
});
const view = new MapView({
  map: map,
  center: [-100, 40],
  zoom: 6
});
```

Watch for property changes

- Watch for changes

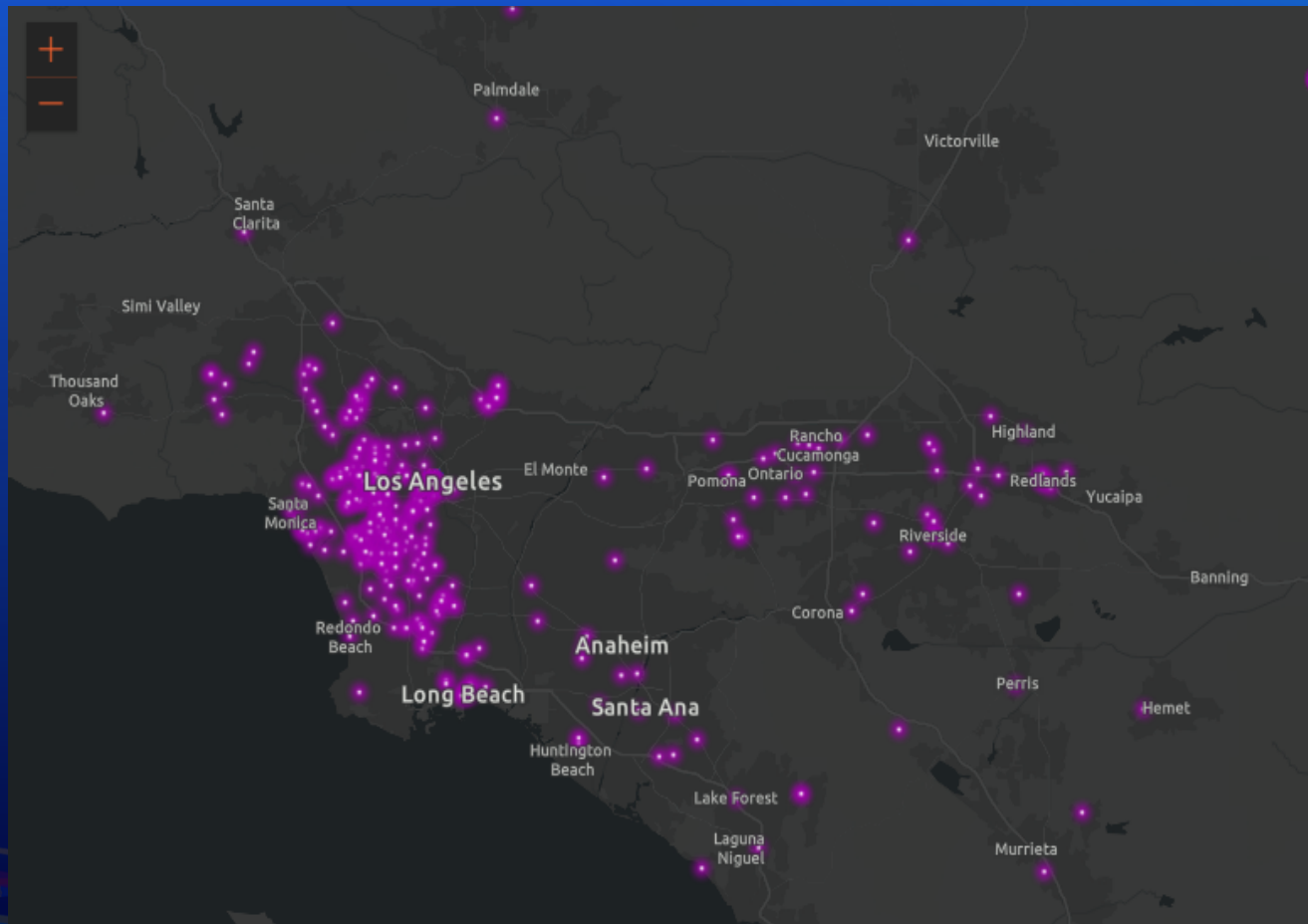
A code editor window with a white background and a shadow. It features three colored window control buttons (red, yellow, green) in the top-left corner and a document icon in the top-right corner. The code inside is:

```
layer.watch("loadStatus", function(status) {// do something});
```

```
layer.watch("loadStatus", function(status) {// do something});
```

- Can also use `esri/core/watchUtils` utility methods
- See this in action with the Watch for Changes sample

Demo: Add a FeatureLayer



**Data provided by BLACK GIRLS
M.A.P.P.**

BGMAPP.org

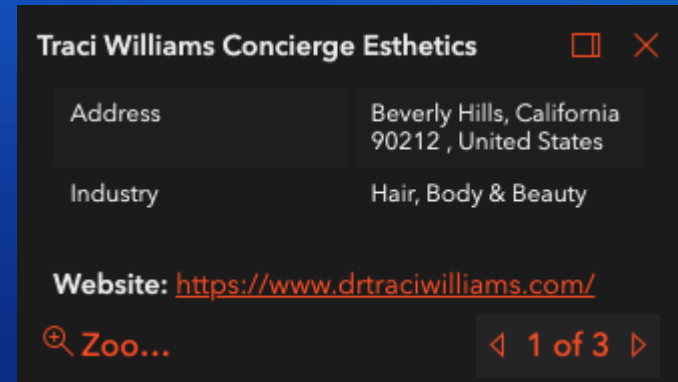


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Map interaction using popups

- Responds to mouse clicks
- Provides info on:
 - feature attributes
 - location
 - search results
- Customizable



PopupTemplate

- View has a default instance of popup
- FeatureLayer has associated popupTemplate property
- Position the popup using `dockOptions`

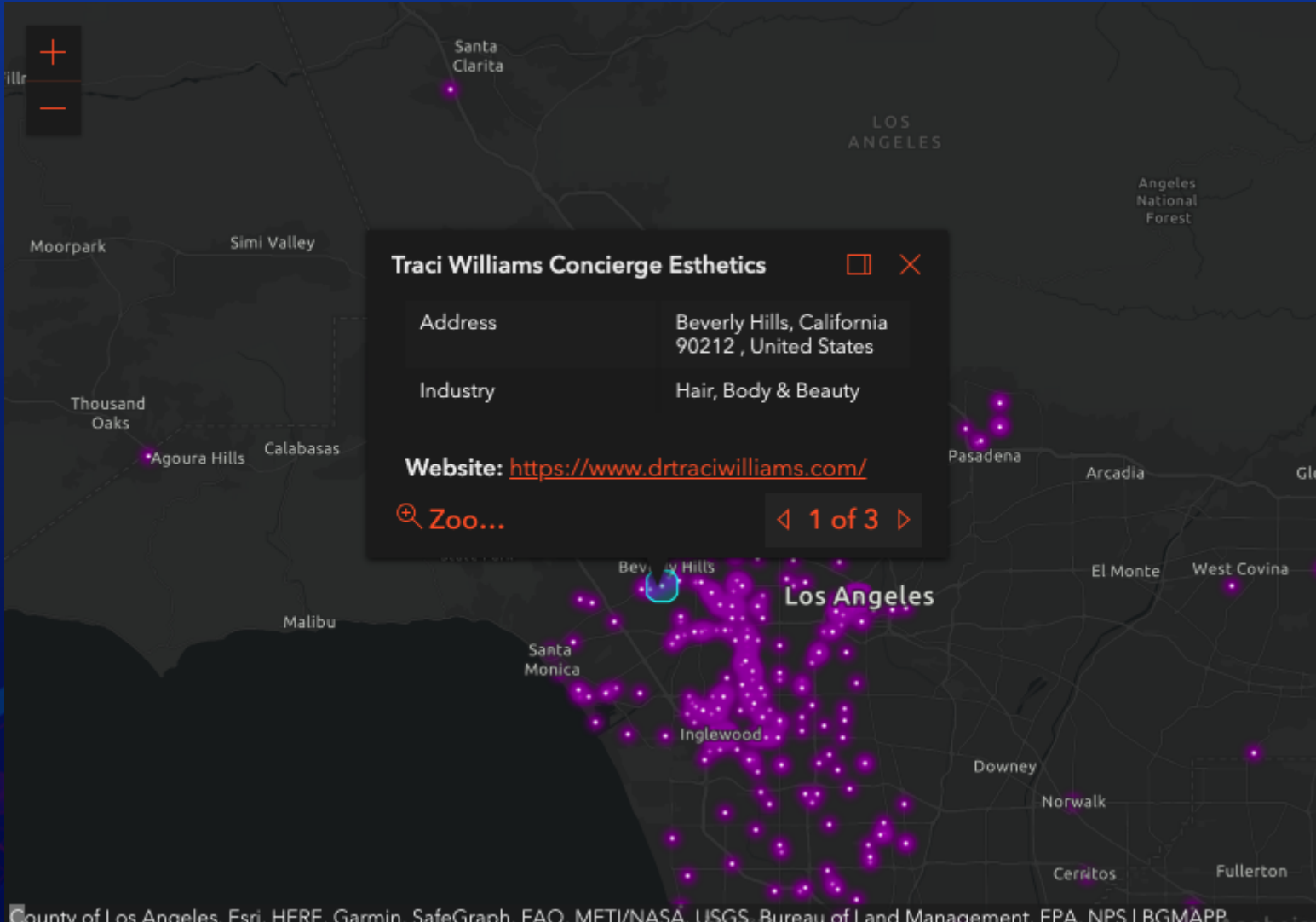
```
const popupTemplate = new PopupTemplate({  
  title: "Title of the popup",  
  content: [{  
    // Set the content here  
  }]  
});
```

```
const featurelayer = new FeatureLayer({  
  url: "url to the feature layer",  
  outFields: ["*"]  
});
```

```
attributes: [ ... ],  
popupTemplate: popupTemplate,  
renderer: renderer  
});
```



Demo: Add a popup to the map



Traci Williams Concierge Esthetics

Address Beverly Hills, California
90212 , United States

Industry Hair, Body & Beauty

Website: <https://www.drtraciwilliams.com/>

Zoo...

1 of 3

Widgets

- Encapsulates functionality
- Similar coding pattern across all widgets



```
// Adding a Legend and Expand widget
const legend = new Legend({
  view: view,
  container: "legendDiv"
});

const expand = new Expand({
  view: view,
  content:
document.getElementById("infoDiv"),
  expanded: true
});

view.ui.add(expand, "top-right");
```

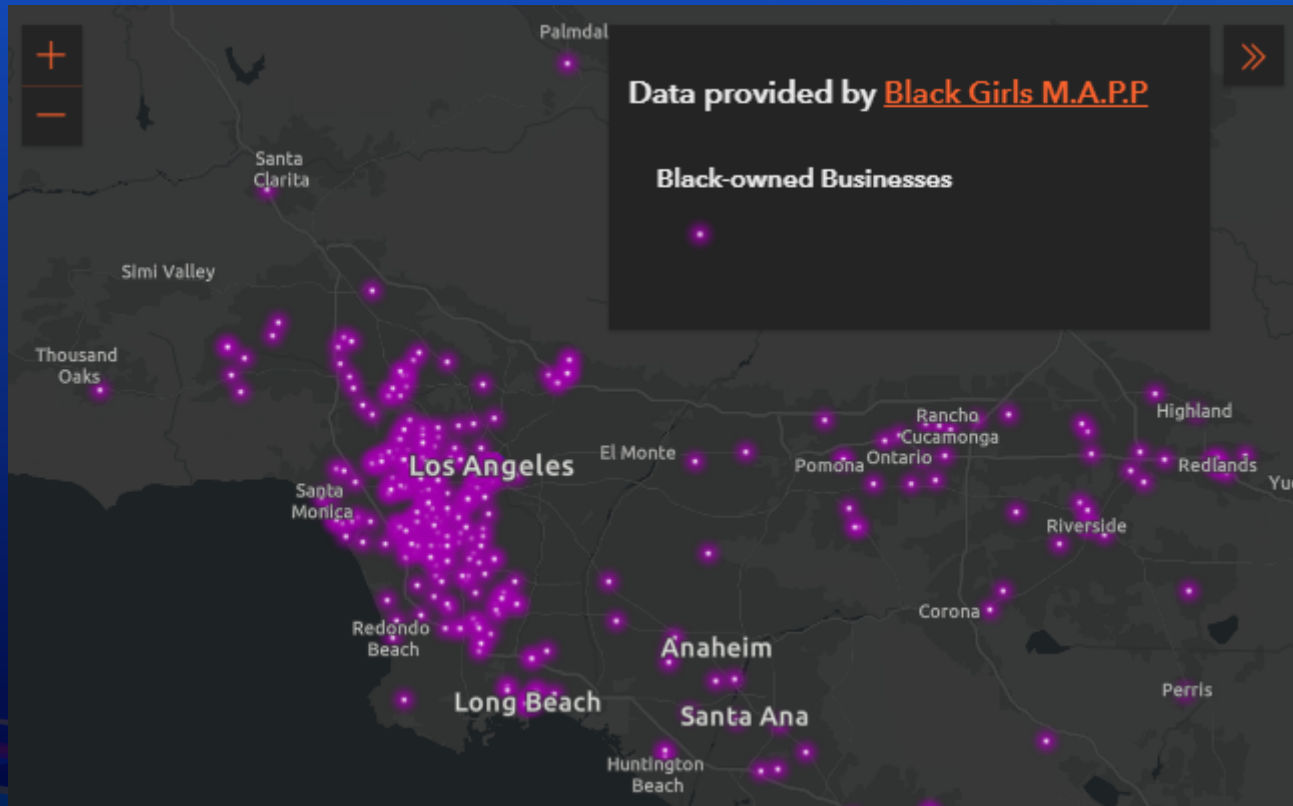
View UI

- Position widgets
 - Add
 - Move
 - Remove



```
view.ui.add(expand, "top-  
right");
```


Demo: Add widgets to the application



Jose Banuelos



Renderers

- Define a set of symbols to use for the layer
- Sets the rules on how the symbols are used
- Basic coding pattern



```
const layerRenderer = new UniqueValueRenderer(); // Set the renderer
const featurelayer = new FeatureLayer({
  url: "featurelayer url",
  renderer: layerRenderer // pass in renderer to featurelayer using
  default properties
})
```

Symbols

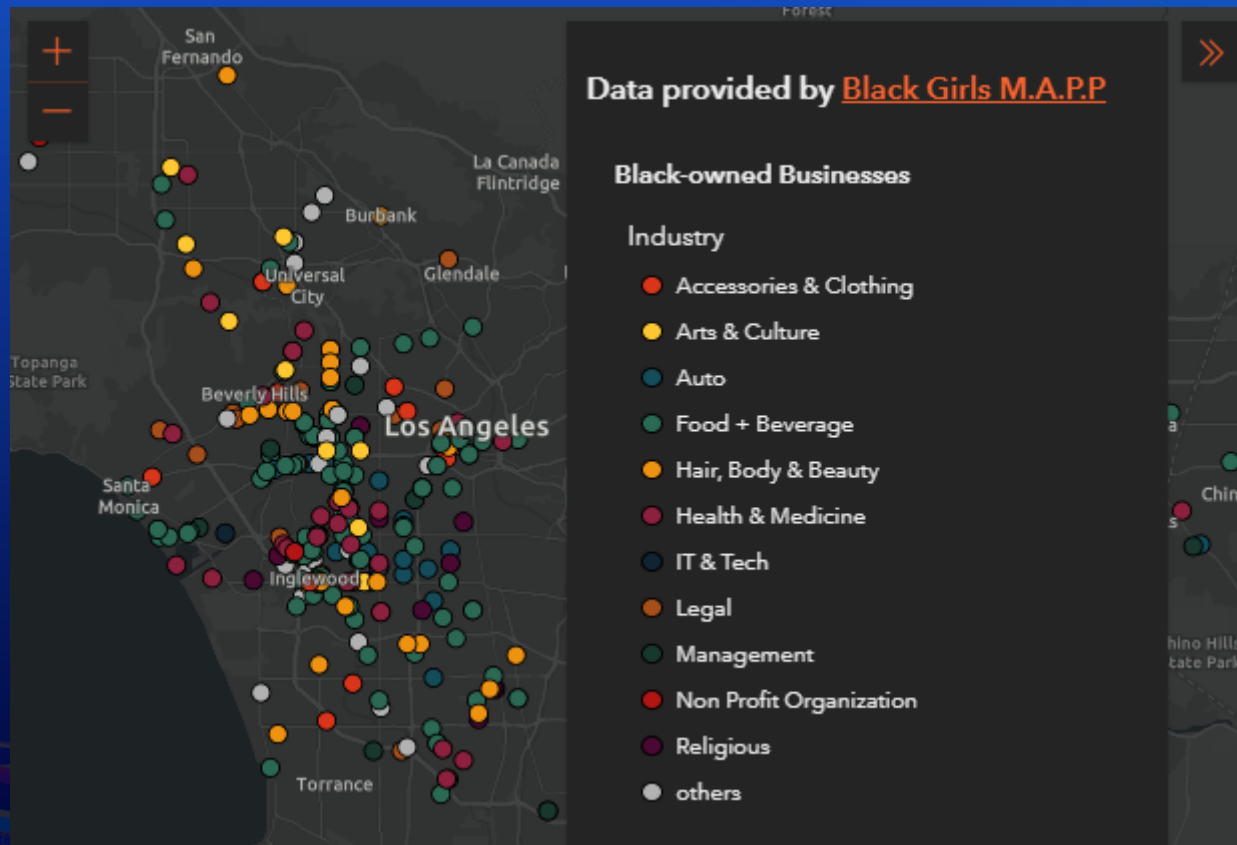
- Renderers use symbology, e.g. points, lines, polygons
- Can set symbology via a renderer's visual variables

```
const sizeVisualVariable = {
  type: 'size',
  field: 'WIND_SPEED',
  minDataValue: 0,
  maxDataValue: 60,
  minSize: 8,
  maxSize: 40
}
// Apply visual variable to renderer
renderer.visualVariables = [sizeVisualVariable]
// Create the layer
const featureLayer = new FeatureLayer({
  url: '<URL to feature layer',
  outFields: ['*'],
  renderer: renderer // Add the renderer to the feature layer
})
```

Autocasting

- No need to `Require()` the module
- Look for the `autocast` label in the API Reference
- Create a layer from portal item sample shows autocasting in action
- Read more about Autocasting in the Guide

Demo: Update a FeatureLayer's renderer

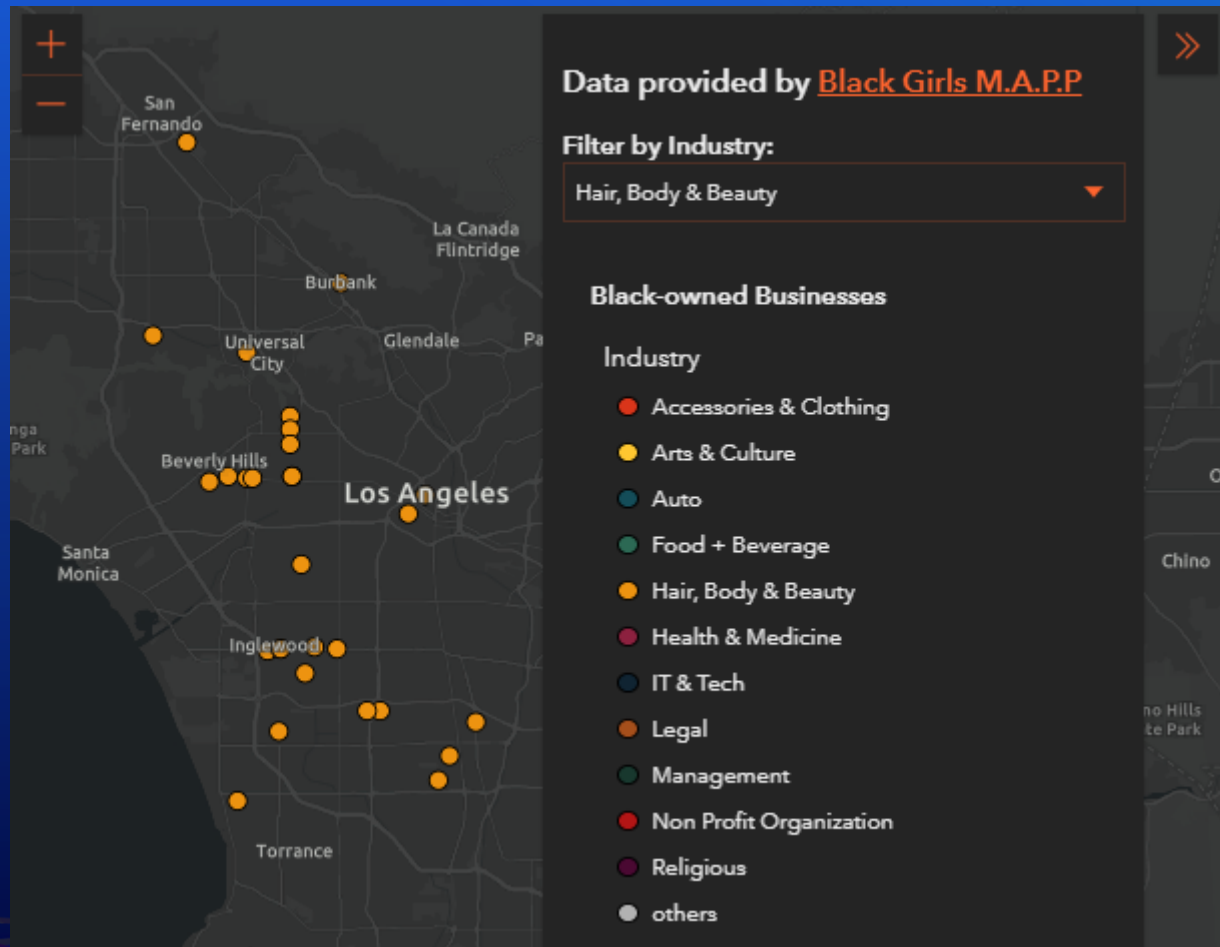


Filtering data

- FeatureFilter
- FeatureLayerView
- All data is filtered on the client = better performance

```
filterSelect.addEventListener('input', (event) => {
  let filterExpression;
  if(event.target.value === '1=1') {
    // show all the features
    filterExpression = event.target.value
  } else if(event.target.value === "other") {
    // Show all other features with all other industries not
    // included in the UniqueValueRenderer.uniqueValueInfos
    filterExpression = generateOtherSQLString(field);
  } else {
    // Filter by the selected industry in the dropdown
    filterExpression = `${field}='${event.target.value}'`;
  }
  // Apply the filter on the client-side layerView.
  // No request will be sent out to the feature service for this.
  layerView.filter = {
    where: filterExpression
  }
});
```

Demo: Client-side feature filtering



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Demo: More widgets (FeatureTable)

Black-owned Businesses (Features: 963, Selected: 1)

	Business Name	Address	Website	Industry
<input type="checkbox"/>	Agadinos Laboratories	5201 Granddinnered Parkw...	http://www.agadinoslabs.com/	Health & Medicine
<input type="checkbox"/>	Agent Hi5 Productions	785 60th Street, Suite 4, O...	http://www.agenthi5.com/	Marketing & Advert
<input type="checkbox"/>	Ahadu Restaurant	6430 Telegraph Ave, Oakl...		Food + Beverage
<input type="checkbox"/>	AJ Crimson Cosmetics	729 North La Brea, Los An...	https://ajcrimson.com/	Hair, Body & Beauty
<input type="checkbox"/>	A-List Signs & Banners	4323 N. Selland Suite 101,...	http://www.alistbanners.c...	Marketing & Advert
<input checked="" type="checkbox"/>	ALL ABOUT CARS INC	5200 S Vermont Ave, Los ...		Auto
<input type="checkbox"/>	All Flavor No Grease	728 E 108th St, Los Angel...		Food + Beverage
<input type="checkbox"/>	All Purpose Document De...	7062 OAK COVE CT, Oak ...	http://www.apddshred.com/	Environmental Serv
<input type="checkbox"/>	All Tied Up	616 18th Street, Bakersfiel...		Accessories & Cloth
<input type="checkbox"/>	Allen Louis, OD	1811 Oak Street , Ste. 150,...		Health & Medicine
<input type="checkbox"/>	Alpha Dewee Inc	6208 Rock Quarry Rd, Pal...		Food + Beverage

Where can I get more info?

- SDK Documentation
- Esri-related training and webinars
- JavaScript online training, free and not-so-free
- User forums, e.g. GeoNet, StackExchange, Spatial Community in Slack, etc.

The screenshot displays the Esri Community website interface. At the top, there is a navigation bar with the Esri logo, a search icon, and a 'Sign In' button. Below this is a search bar with the text 'Search all content' and a dropdown menu labeled 'This place'. The main content area shows a breadcrumb trail: 'Home > All Communities > Developers > ArcGIS API for JavaScript'. To the right of the breadcrumb is an 'Options' menu with a 'Subscribe' button. The central section is titled 'All Boards in This Place' and contains five board cards, each representing a discussion board for 'ArcGIS API for JavaScript'. Each card displays the number of views (represented by an eye icon) and the number of replies (represented by a speech bubble icon). At the bottom of the page, there is a 'Latest Activity' section with a 'Sort/Filter : Created' dropdown and a 'Create A Post' button.

Home > All Communities > Developers > ArcGIS API for JavaScript

Options :
Subscribe

All Boards in This Place

Board Title	Views	Replies
ArcGIS API for JavaScript ...	32602	33
ArcGIS API for JavaScript ...	5023365	16280
ArcGIS API for JavaScript ...	45047	27
ArcGIS API for JavaScript ...	1481	11
ArcGIS API for JavaScript I...	3402	14

Latest Activity

Sort/Filter : Created

Create A Post



Please provide your feedback for this session by clicking on the session survey link directly below the video.