Front-End Web Technologies for Geospatial Developers

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2024 ESRI DEVELOPER SUMMIT

First, some JavaScript

Promises
async/await
Events

Promises

The eventual completion (or failure) of an async operation - and its resulting value

Chainable

Error handling with `.catch()`

```
queryFeatures({ url: featureServiceUrl, where: "Status = 'Active' "})
    .then(layer => normalizeSiteData(layer))
    .then(sites => filterResults(sites))
    .catch(error => {
        console.log(error)
    });
```

async/await

```
document.addEventListener("calciteInputChange", async (event) => {
  const address = { singleLine: event.target.value };
  const serviceUrl =
    "https://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer";

  try {
    const locations = await addressToLocations(serviceUrl, { address });
    // Do something with the data from the resolved promise
  } catch (error) {
    console.log(error)
  }
});
```

Created on top of the Promise object

Async: returns a promise

Await: used inside sync function to get the promise's result

Simplifies syntax (no chaining)

Error handling? try/catch statement

Events

```
const button = document.getElementById("thatButton");
button.addEventListener("click", (e) => {
  console.log(`${e.target.id} was clicked!`);
})

document.addEventListener("calciteChipGroupSelect", (e) => {
    const filters = e.target.selectedItems.map((selected) =>
selected.value);
    // do something with this new array of selected values
  });
```

Emitted by HTML elements

Event listeners can be attached to document, DOM nodes

Calcite components uses CustomEvents

CustomEvents behave similarly to native browser events

Calcite Design System

Calcite Components

Web components

Custom elements
Slots
Shadow DOM

Custom Elements

```
<calcite-chip value="vegetables">
    Vegetables
</calcite-chip>
```

HTML elements with custom behavior

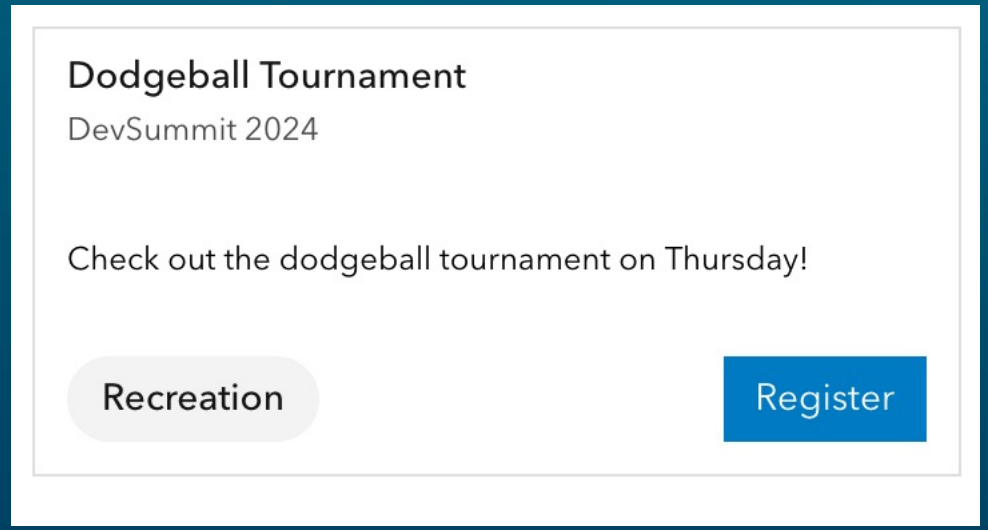
Inherit from native HTML elements.

`CustomElementRegistry` & `whenDefined()`

Slots

```
<calcite-card>
  <h4 slot="title">Dodgeball Tournament</h4>
  <p slot="description">DevSummit 2024</p>
  <p>Come play dodgeball!</p>
  <div slot="footer-start">
    <calcite-chip>Recreation</calcite-chip>
  </div>
  <div slot="footer-end">
    <calcite-button>Register</calcite-button>
  </div>
</calcite-card>
```

Placeholder elements within web components



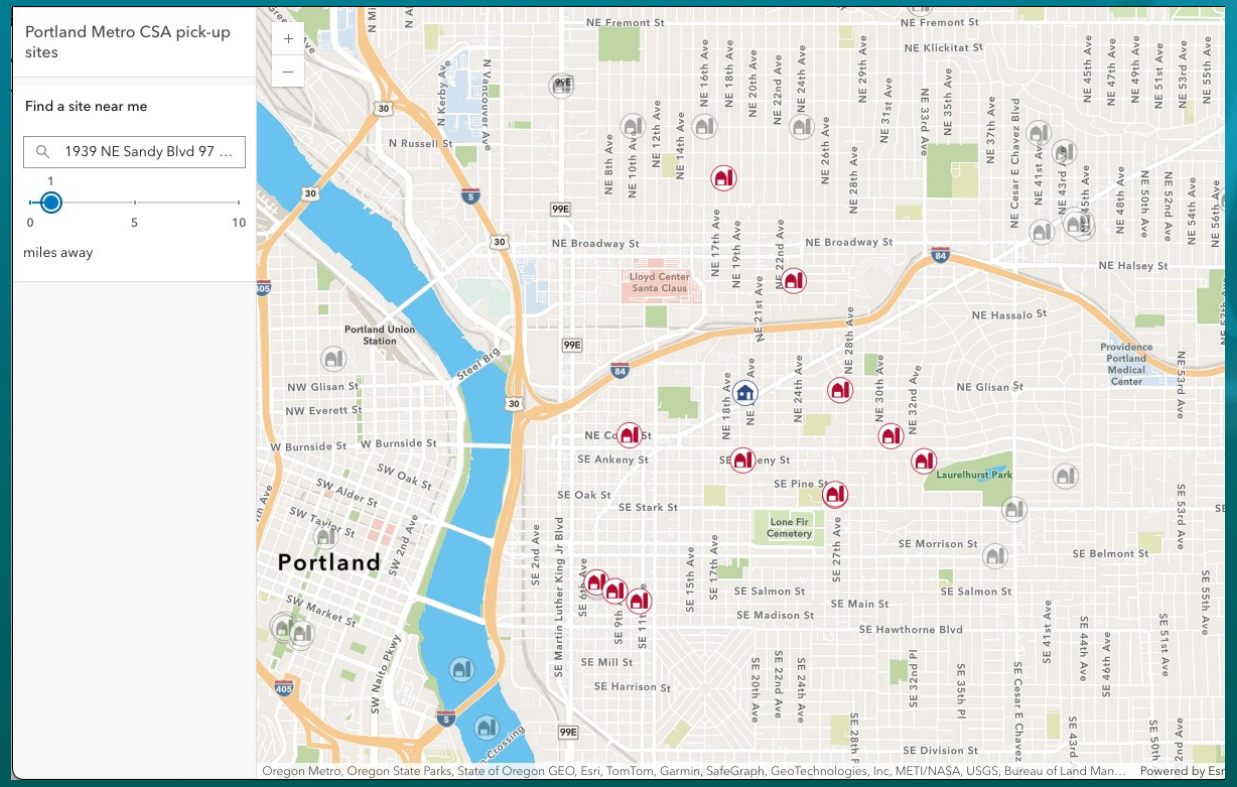
Shadow DOM

The Document Object Model (DOM) represents the page (document) as a tree of nodes and objects.

Shadow DOM allows hidden DOM trees to be attached to elements in the regular DOM

Enables encapsulation of custom elements.

CSA pick-up sites: Map Demo

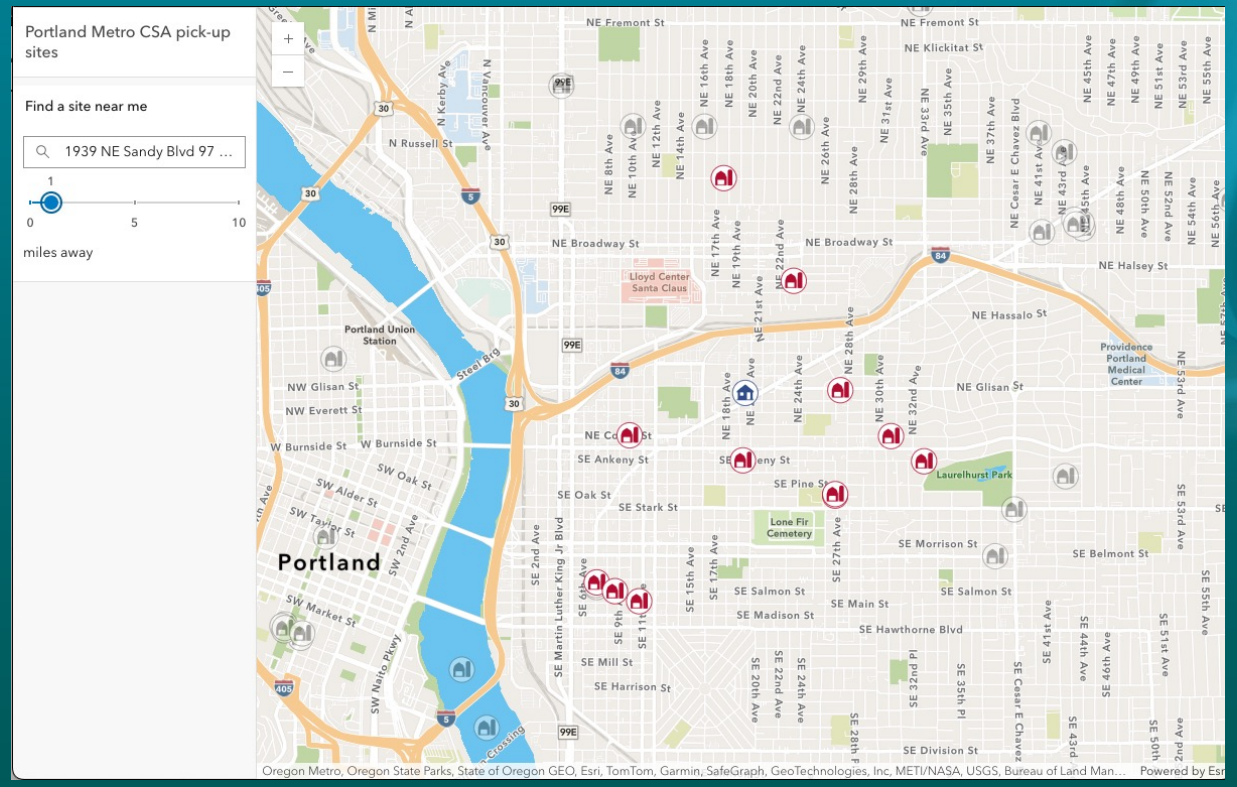



```
view.goTo({
  center: [-126, 49]
})
.catch(function(error) {
  if (error.name != "AbortError") {
    console.error(error);
  }
});
```

```
queryParameters =
QueryParameters().apply {
  whereClause = "price > 200"
}
viewModelScope.launch {
```


WE'RE FROM PORTLAND
OF COURSE WE SUPPORT COMMUNITY AGRICULTURE

CSA pick-up sites: Map Demo

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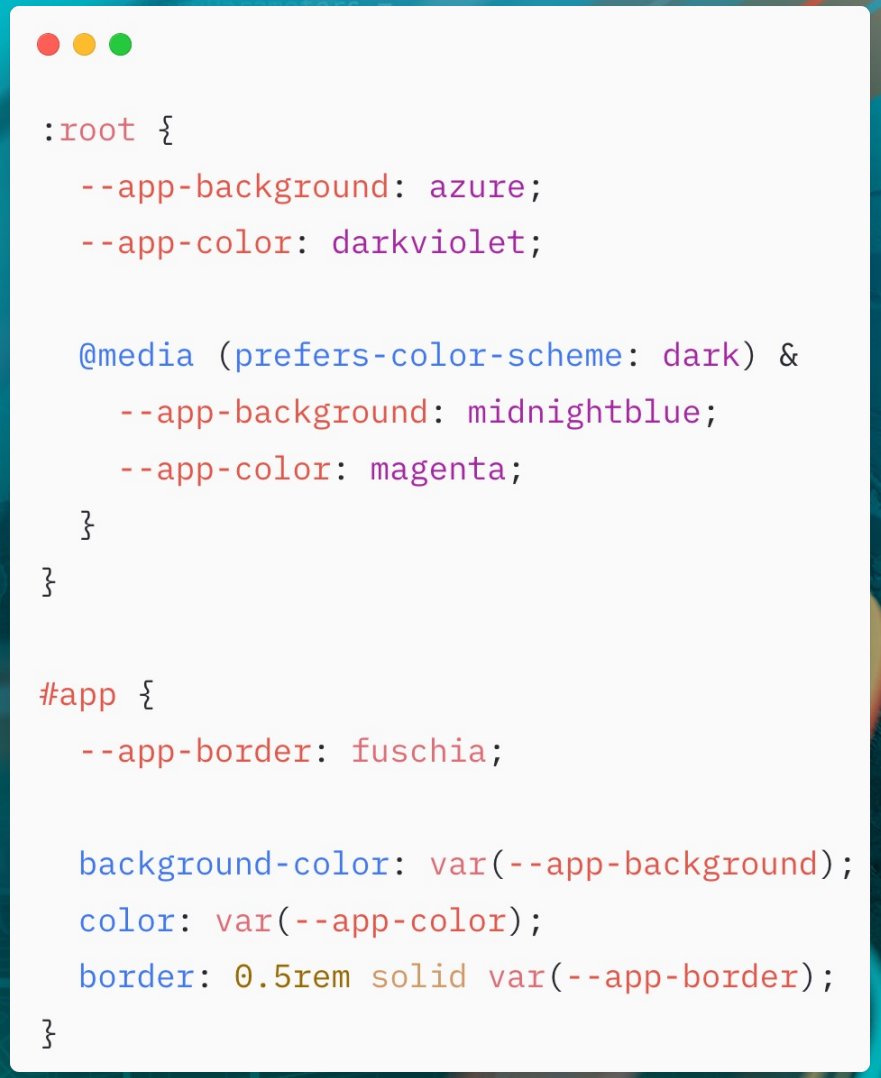
CSS

Cascading Style Sheets



```css
:root {
  --app-background: azure;
  --app-color: darkviolet;

  @media (prefers-color-scheme: dark) &
    --app-background: midnightblue;
    --app-color: magenta;
  }
}

#app {
  --app-border: fuschia;

  background-color: var(--app-background);
  color: var(--app-color);
  border: 0.5rem solid var(--app-border);
}
```

Custom Properties

Store & retrieve CSS values.
Change values for specific elements, or under certain conditions.
Pierce the Shadow DOM!
Can be used anywhere a CSS value is valid, even inside functions.

```
#app {
  --app-text-color: plum;
  --app-padding: 0.5rem;

  padding: calc(1rem + var(--app-padding));

  color: var(--app-color, var(--app-text-color));

  font-size: var(--app-font-size, 1rem);

  border: 0.5rem solid var(--app-color);
}
```

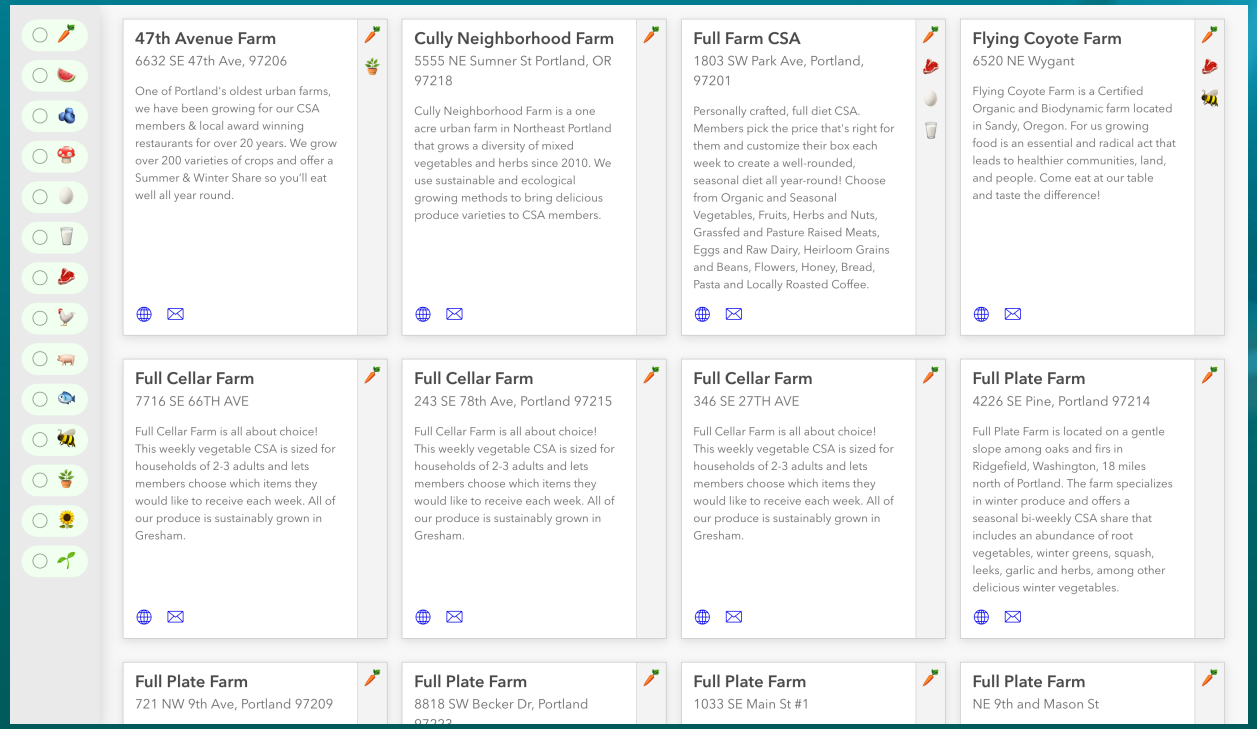
`var()`

Output the value of a named custom property.
Valid in any part of a value, including functions like `calc()`.
A fallback will be used if the custom property is invalid; this could be another `var()`.

ArcGIS REST JS

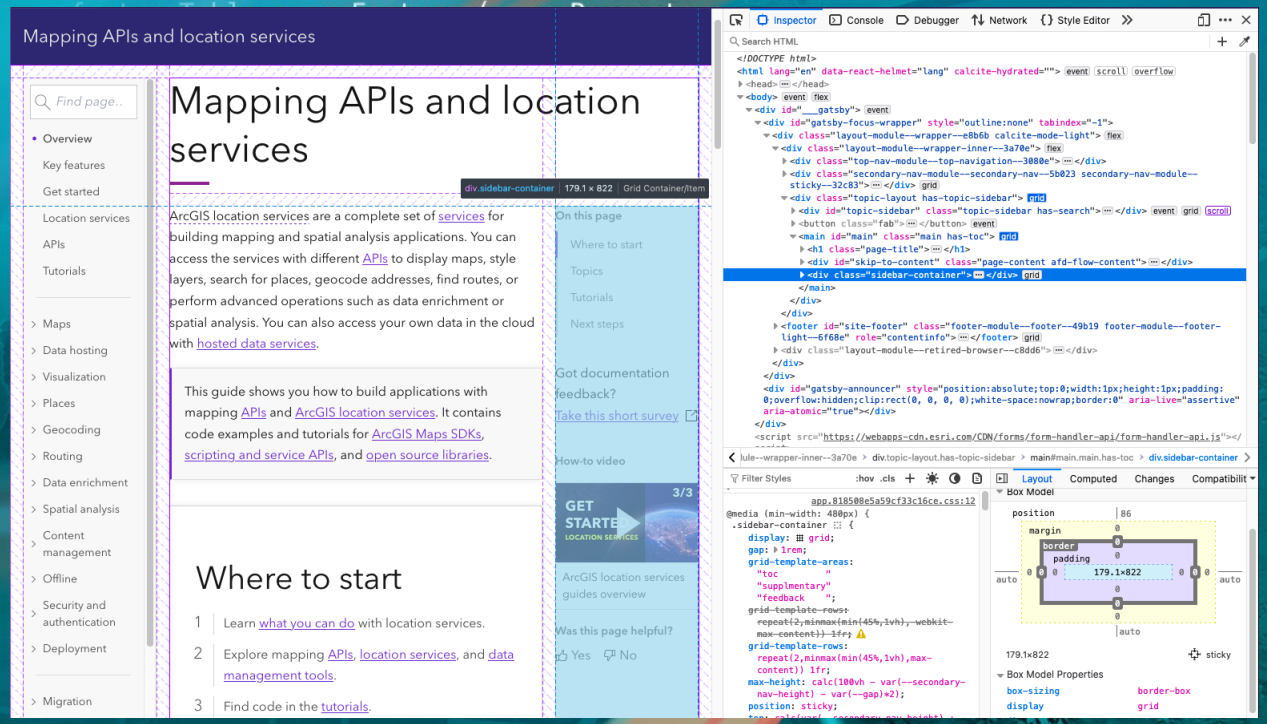
developers.arcgis.com/arcgis-rest-js

CSA pick-up sites: List demo



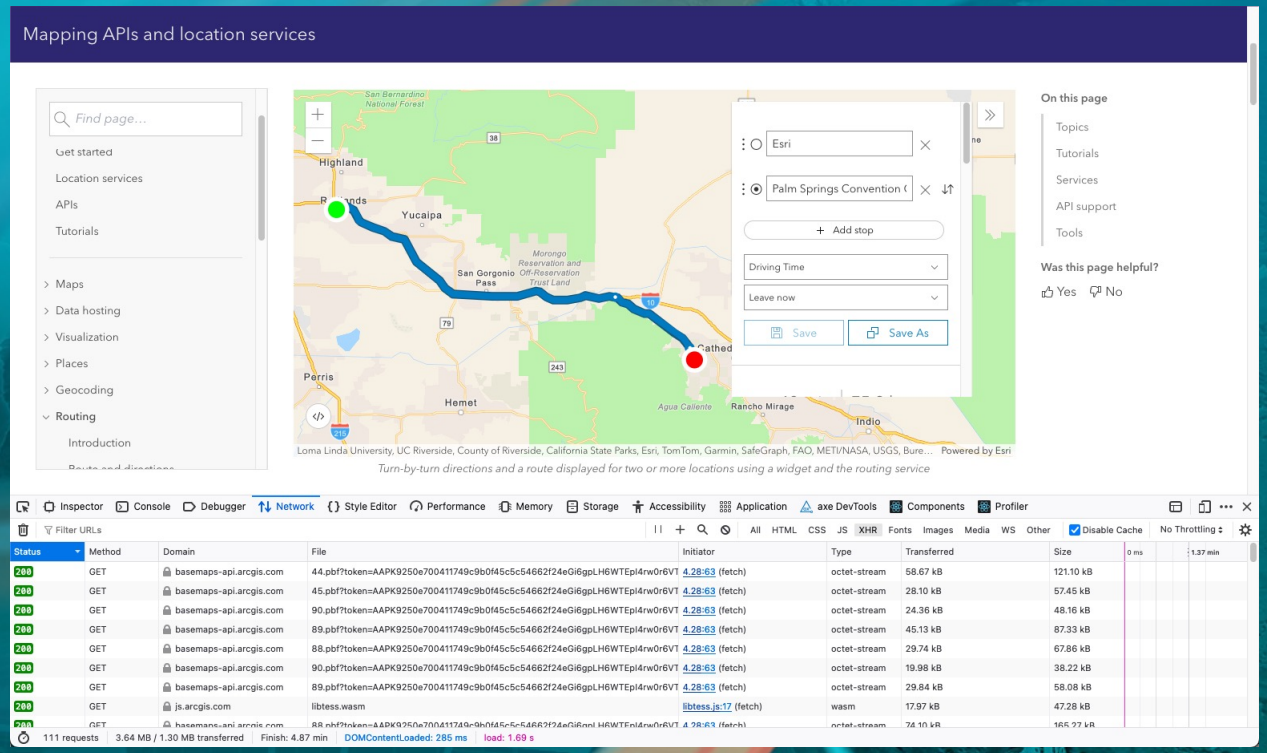
Browser Developer Tools

Inspector
Network
Responsive Mode



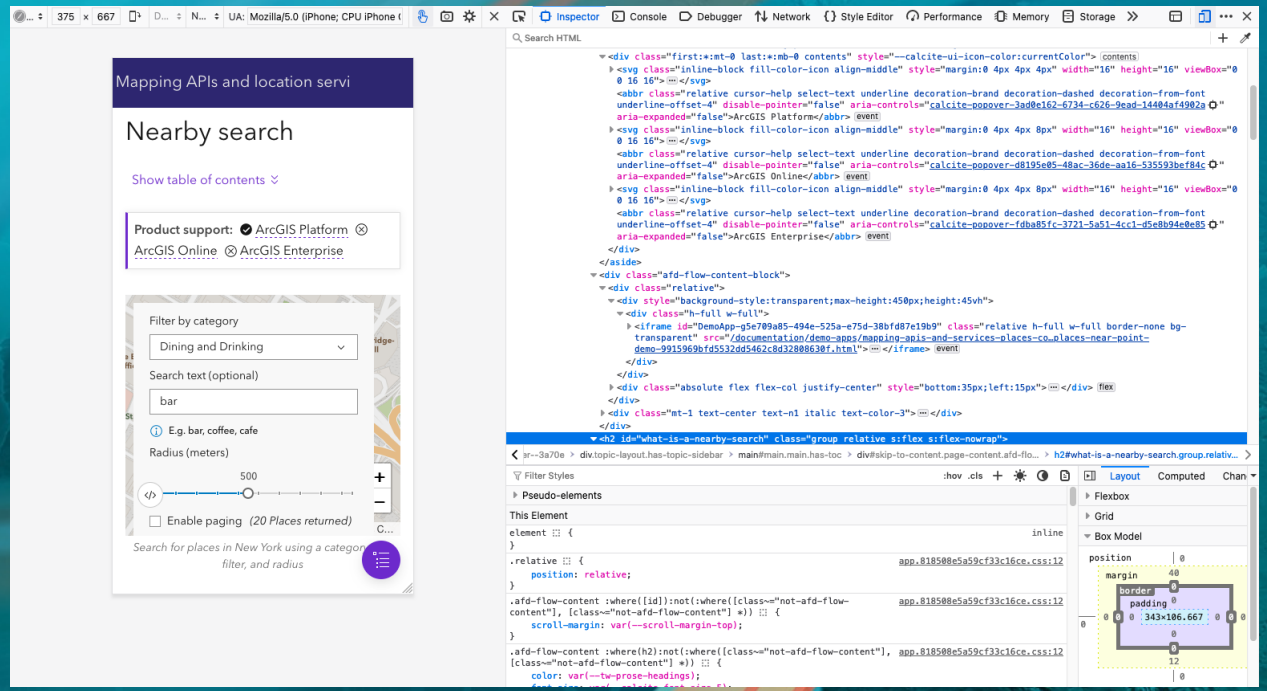
Inspector

Show grid and flex layouts.
Modify CSS properties and values.
Edit element pseudo-classes.
Visualize box model layout.



Network

Troubleshoot slow resources.
Inspect `http` responses.
Modify `http` request parameters.



Responsive Mode

Simulate viewport dimensions.

Test `@media` queries.

Find fluid layout problems.

Resources

Demo code and more resources: github.com/araedavis/esri-dev-summit-2024
ArcGIS Developers documentation: developers.arcgis.com/documentation

MDN web docs
developer.mozilla.org

Frontend Masters
frontendmasters.com/guides

JavaScript 30
javascript30.com

Can I Use
caniuse.com

Modern CSS Solutions
moderncss.dev

Grid by Example
gridbyexample.com

Other Sessions to 👀 at Dev Summit

To name just a few!

- Building Web Apps with ArcGIS Maps SDK for JavaScript and Calcite Design System
  Wednesday, Mar 13 • 1:00 PM • Primrose B
- Build Accessible Web Apps with ArcGIS Maps SDK for JavaScript and Calcite Design System
  Wednesday, Mar 13 • 4:00 PM • Primrose CD
- Building Web Apps with Calcite Design System and React
  Thursday, Mar 14 • 10:30 AM • Demo Theater 1
- Building Apps with ArcGIS Maps SDK for JavaScript Components
  Thursday, Mar 14 • 1:00 PM • Primrose CD

Please Share Your Feedback in the App

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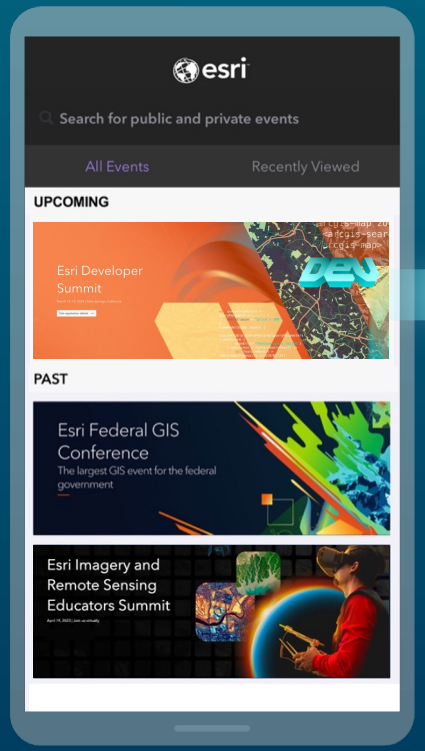
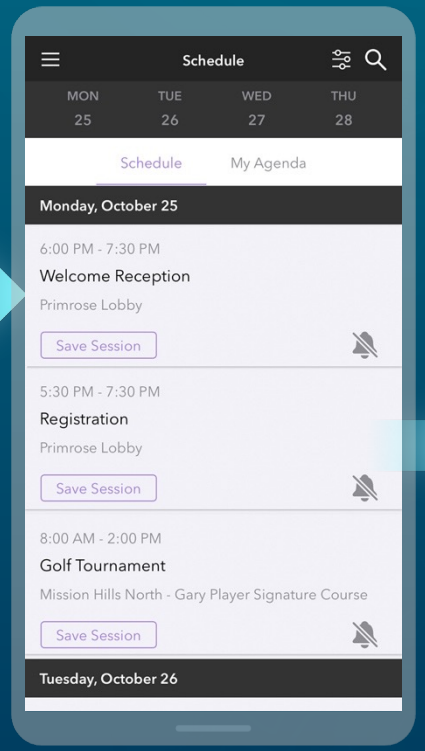
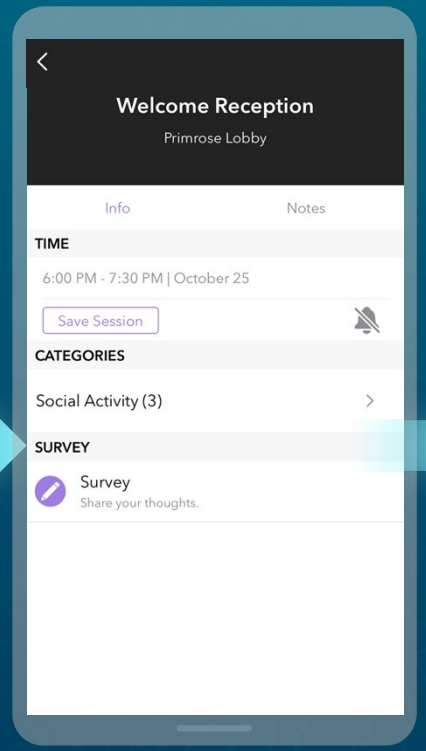


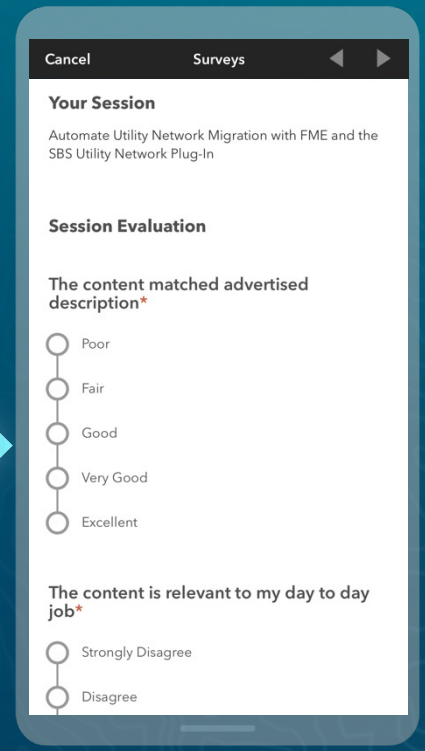
Select the session you attended



Scroll down to “Survey”



Log in to access the survey



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