



ESRI DEVELOPER SUMMIT 2023

Building an Instant App in React with TypeScript

Cameron Smith and Ryan Libed

Introductions



Cameron Smith

Software Engineer on
ArcGIS Instant Apps

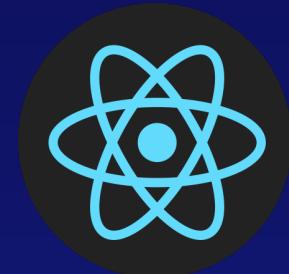


Ryan Libed

Software Engineer on
ArcGIS Instant Apps

Agenda

- Introduction to ArcGIS Instant Apps
 - What are they?
 - Architecture Overview
- Technologies
 - React
 - TypeScript
 - Calcite Components
 - ArcGIS Maps SDK for JavaScript
- Demo
 - Create your own Instant App Ecosystem

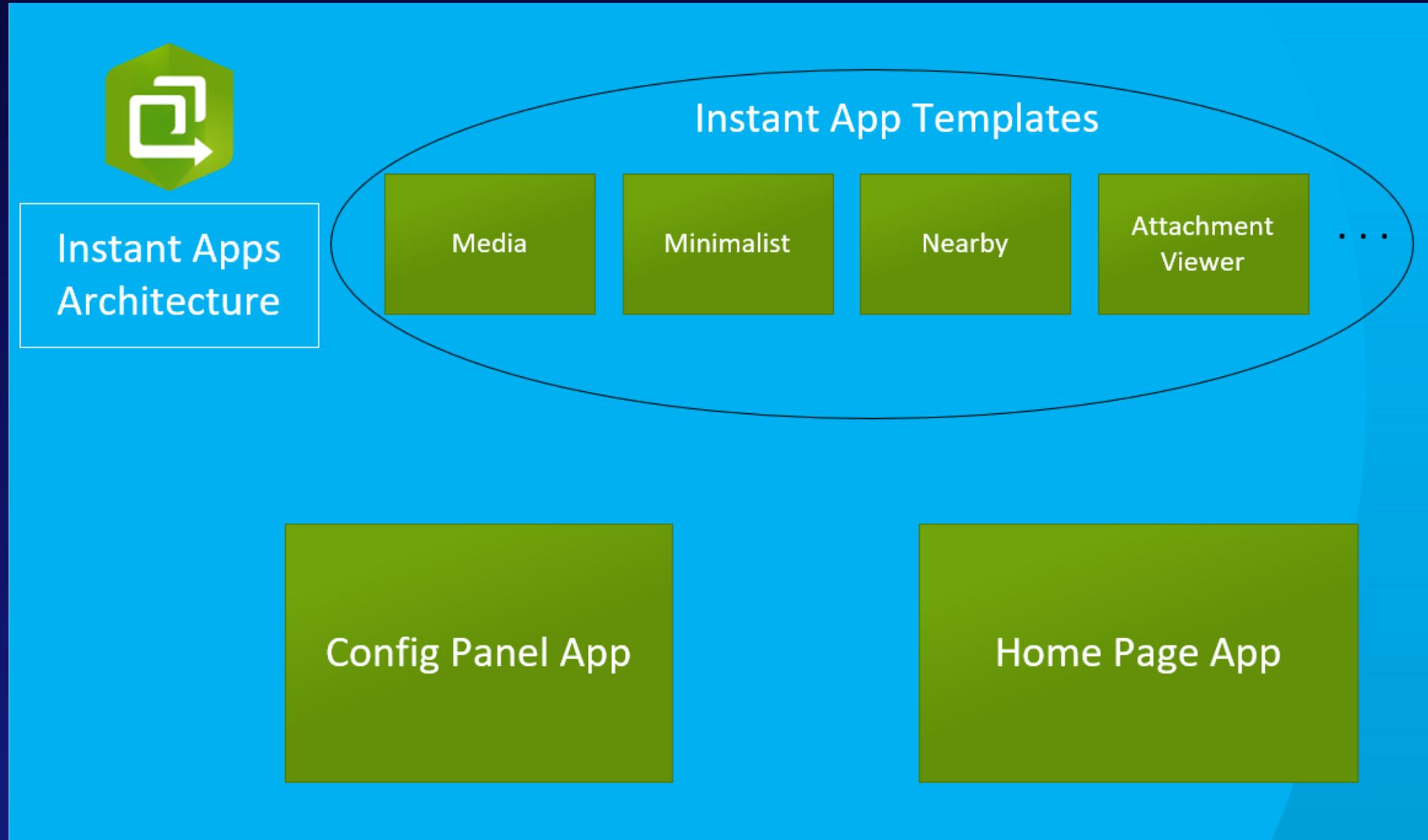


What is ArcGIS Instant Apps?

- App Builder System
 - Wix, squarespace... etc
 - Instant Apps is the same, but for Spatial Web Apps



Instant Apps Architecture



Most Important:

Portal Item



Portal Item:

- Find page...
- > esri
- > esri/analysis
- > esri/core
- > esri/form
- > esri/geometry
- > esri/identity
- > esri/layers
- > esri/networks
- > esri/popup
- < esri/portal
- Portal
- PortalFolder

PortalItem

AMD: `require(["esri/portal/PortalItem"], (PortalItem) => { /* code goes here */ });`

ESM: `import PortalItem from "@arcgis/core/portal/PortalItem.js";`

Class: `esri/portal/PortalItem`

Inheritance: `PortalItem > Accessor`

Since: ArcGIS Maps SDK for JavaScript 4.0

An item (a unit of content) in the Portal. Each item has a unique identifier and a well known URL that is independent of the user owning the item. An item may have associated binary or textual data which is available via the item data resource. View the ArcGIS portal API REST documentation for the [item](#) for more details.



Content

My Content

My Favorites

My Groups

My Organization

Living Atlas

[New item](#)[Create app](#) Search csmith_CATs[Table](#)[Date Modified](#)[Filter](#)

Folders



1 - 20 of 217 in csmith_CATs

Filter folders

- [All my content](#)
- [csmith_CATs](#)
- [_UC 2022 - 1 - Media Map Example](#)
- [_UC 2022 - 2 - Slider Time Example](#)
- [_UC 2022 - 3 - Slider Numeric Ex 1](#)
- [_UC 2022 - 4 - Slider](#)

Filters

[Categories](#)

- [water](#)
- [Geology](#)
- [fgngfjhdgfjdhfghdj](#)
- [Atlas \(Beta\)](#)

[Item type](#)

- [Maps](#)
- [Layers](#)
- [Scenes](#)
- [Apps](#)
- [Developer credentials](#)
- [Tools](#)

<input type="checkbox"/>	Title		Modified
<input type="checkbox"/>	Slider Prod Test	Instant App	Mar 3, 2023
<input type="checkbox"/>	3D Viewer - CORS test	Instant App	Mar 2, 2023
<input type="checkbox"/>	Atlas Imrgy Layer test	Instant App	Feb 28, 2023
<input type="checkbox"/>	GEBCO Shaded Relief 2021 MAP	Web Map	+ M Feb 28, 2023
<input type="checkbox"/>	Atlas Imagery Tile Test	Instant App	Feb 27, 2023
<input type="checkbox"/>	Imagery Tile Service Example	Web Map	+ M Feb 27, 2023
<input type="checkbox"/>	Tiled Imagery Layer Example	Web Map	Feb 27, 2023
<input type="checkbox"/>	Labor Stats	Instant App	Feb 24, 2023
<input type="checkbox"/>	Labor Stats	Web Map	Feb 24, 2023
<input type="checkbox"/>	Untitled experience 1	Web Experience	Feb 23, 2023
<input type="checkbox"/>	My scene	Web Scene	Feb 23, 2023
<input type="checkbox"/>	Copy of Copy of Mt. St. Helens point cloud by chyrse_wma	Web Scene	Feb 23, 2023
<input type="checkbox"/>	Insets - Onboarding Tooltip test	Instant App	Feb 23, 2023
<input type="checkbox"/>	testadsafadfs	Instant App	Feb 23, 2023
<input type="checkbox"/>	retwetwrretwewtr	Instant App	Jan 27, 2023

← → C H webapps.maps.arcgis.com/home/item.html?id=b749b733fa8642feb47a0dea8752c2d 🔍 ⭐ ⓘ JS

Home Map Scene Notebook Groups Content Organization

Cameron Smith
csmith_CATs

Imagery Tile Service edit

edit thumbnail Add a brief summary about the item. edit

Web Map by csmith_CATs

Item created: Feb 27, 2023 Item updated: Feb 27, 2023 View count: 12

edit Add to Favorites

Description edit
Add an in-depth description of the item.

Layers edit
 Esri_2020_Land_Cover_V2 Tiled Imagery Layer

Item Information learn more
Low High
💡 Top Improvement: Add a summary

Details

Overview Usage Settings

Open in Map Viewer dropdown

Open in ArcGIS Desktop dropdown

Open in Field Maps Designer

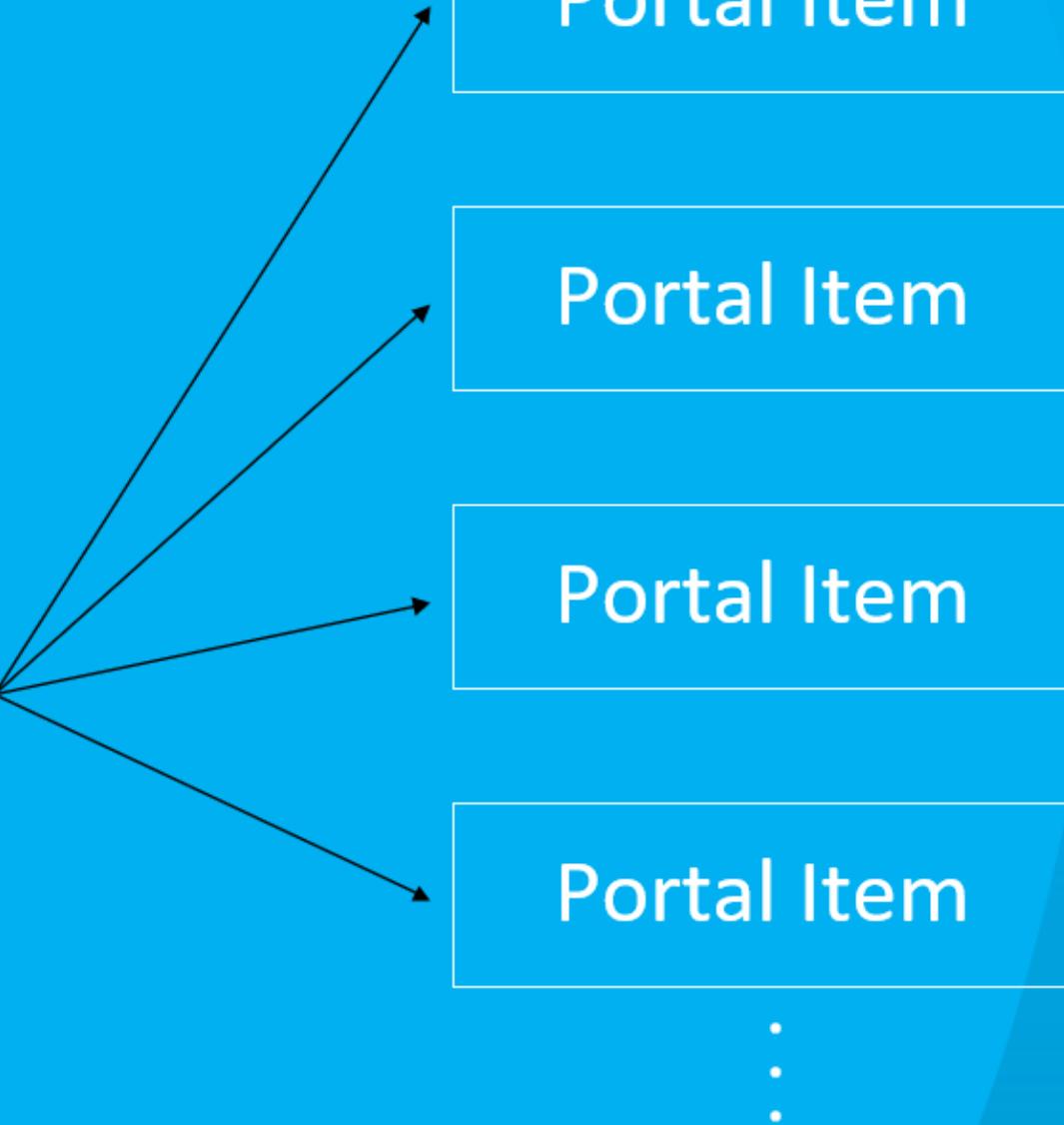
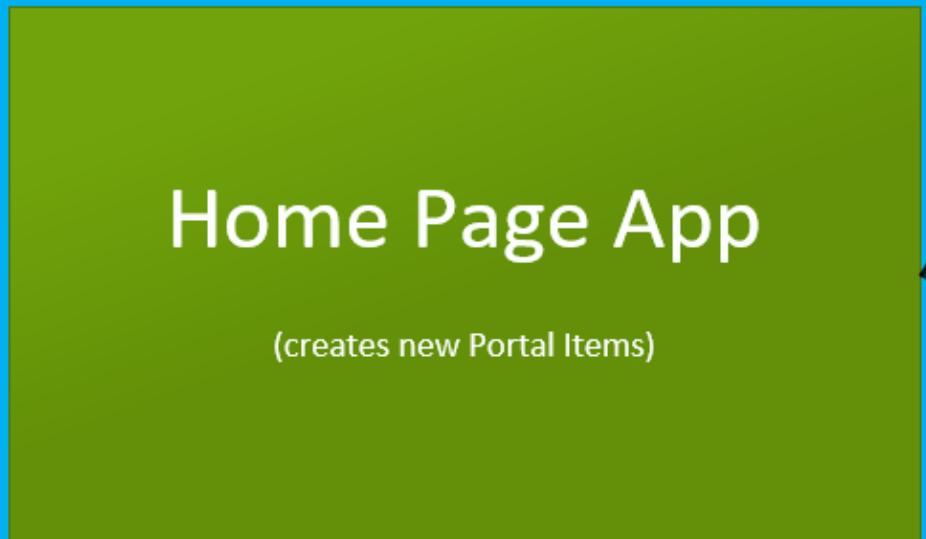
Create Web App dropdown

Share

Metadata

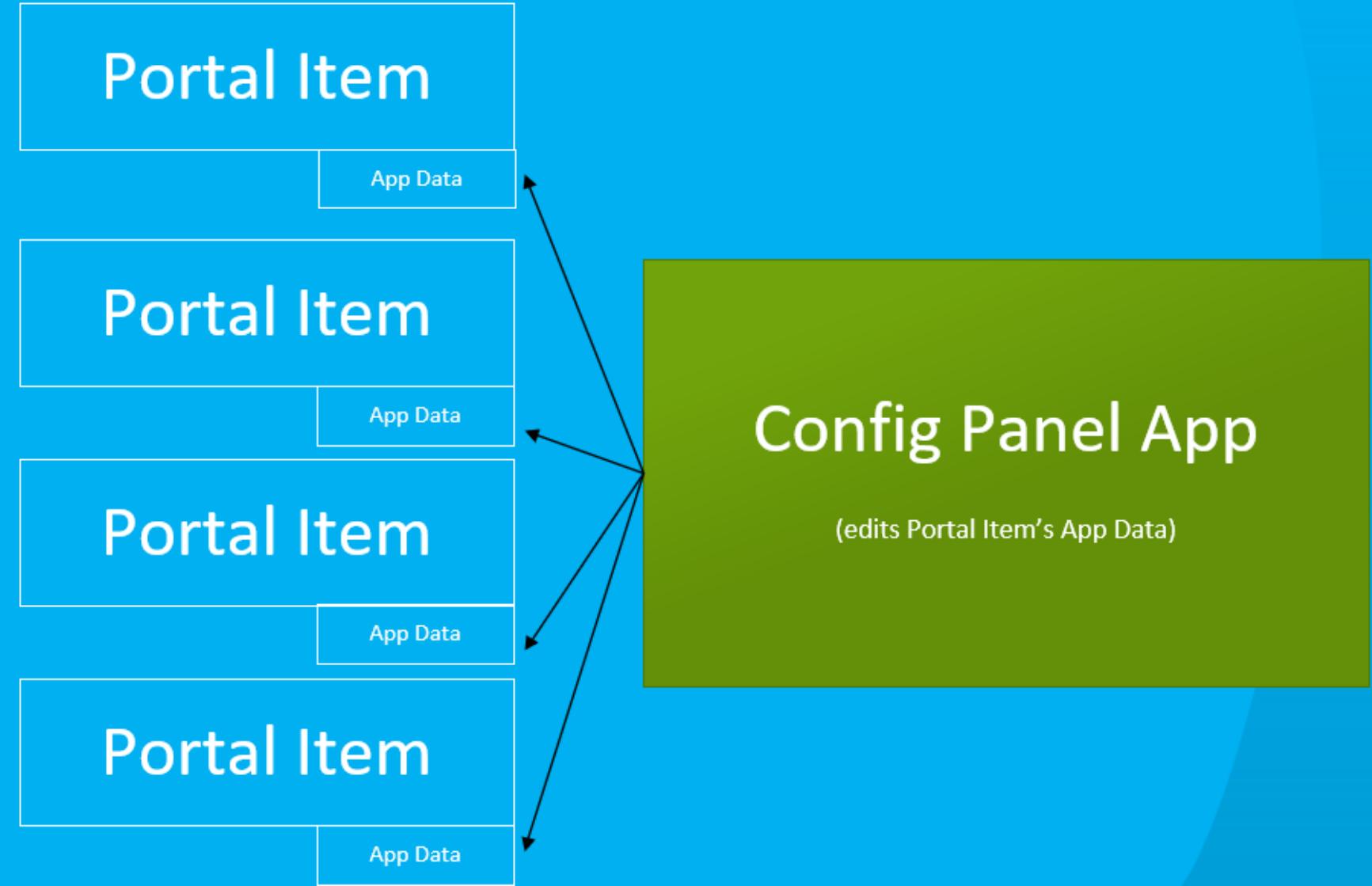


Instant Apps
Architecture



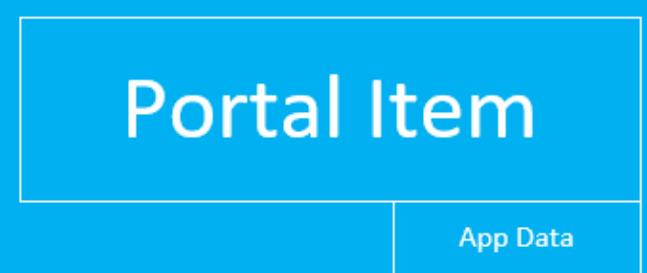
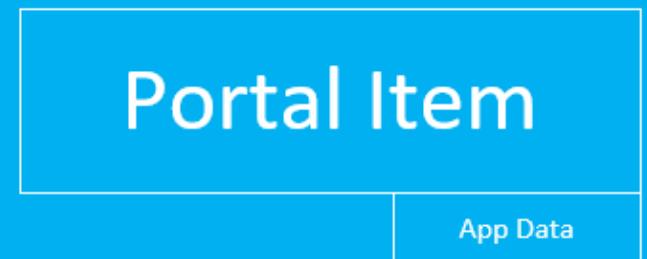
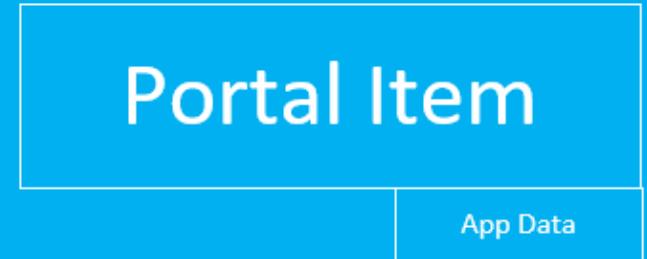


Instant Apps Architecture





Instant Apps Architecture



Nearby
Template

(reads Portal Item's App Data)

Sidebar
Template

(reads Portal Item's App Data)

Basic
Template

(reads Portal Item's App Data)

Technologies

```
const view = new View({  
  container: "view",  
  map: map,  
  environment: {  
    lightings: {  
      directShadowsEnabled: true  
    }  
  }  
})
```

```
const layer = view.map.allLayers.get("layer");  
view.whenLayerView(layer)  
.then((layerView) => console.log(layerView))  
// if there were problems with the layer  
.catch(console.error);
```

ReactJS

- JavaScript library for building user interfaces
- Virtual DOM
- JSX (JavaScript Syntax Extension)
- One-way data binding
- Manage state through `useState` and perform side effects with `useEffect`

TypeScript

- JavaScript with syntax for types
- Open-source programming language developed by Microsoft
- Superset of JavaScript
- Helps with code management
- Throws errors to catch issues earlier on in development

ArcGIS Maps SDK for JavaScript

- "ArcGIS Maps SDK for JavaScript to build compelling web apps that unlock your data's potential with interactive user experiences and stunning 2D and 3D visualizations."
- Integration
 - CDN
 - ESModules
- Portal, PortalItem, WebMap, WebScenes, MapView, SceneView, FeatureLayer, various widgets, and much more...
- Documentation

Calcite Components

- Visual language for products
 - Design guidelines
 - Color, spacing, typography
 - Graphic resources
 - Icons, symbols, Figma UI kit
 - Interactive documentation
 - Patterns & best practices
 - Documentation
- Web Components for Calcite Design System
 - 50+ web components
 - Easily build beautiful consistent apps

Calcite Components

Benefits

- Consistent UX
- Speed up development timelines
- Accessibility
- Web standards
- Framework integration

Web Components

- Custom elements
 - Browser-compatible events
 - Use native APIs
 - DOM element lifecycle
- Shadow DOM
 - Encapsulates component HTML & CSS
 - `<slot>` tag for distributing content
- StencilJS
 - "Stencil is a library for building reusable, scalable, Design systems."

```
<calcite-card>
  <h3 slot="title">Esri</h3>
  
  <span slot="subtitle">
    Esri is an international supplier of geographic information system software...
  </span>
</calcite-card>
```



```
const view = new SceneView({  
  container: "viewDiv",  
  map: map,  
  environment: {  
    lighting: {  
      directShadowsEnabled: true  
    }  
  }  
})
```



Instant Apps Demo

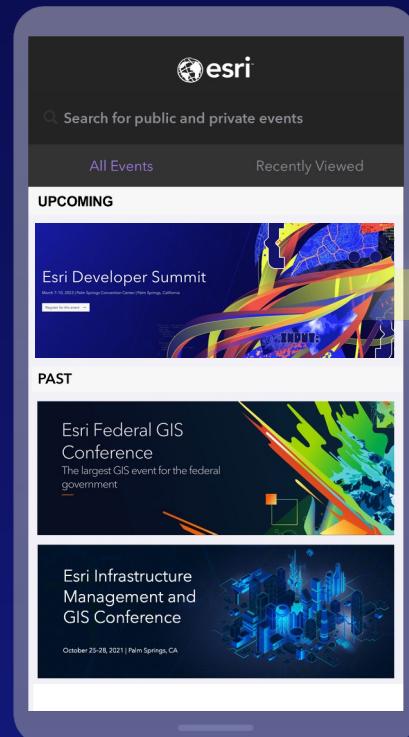
```
const layers = view.map.layers;  
const layerView = layers.getLayerView(0);  
  
layerView.on("load", () => {  
  const layer = layerView.getLayer();  
  console.log(layer);  
});  
  
// If you try to interact with the layerView here, it will throw an error.  
// This is because the layerView is only valid while the layer is being loaded.  
// Once the layer is loaded, the layerView becomes invalid.
```

Resources

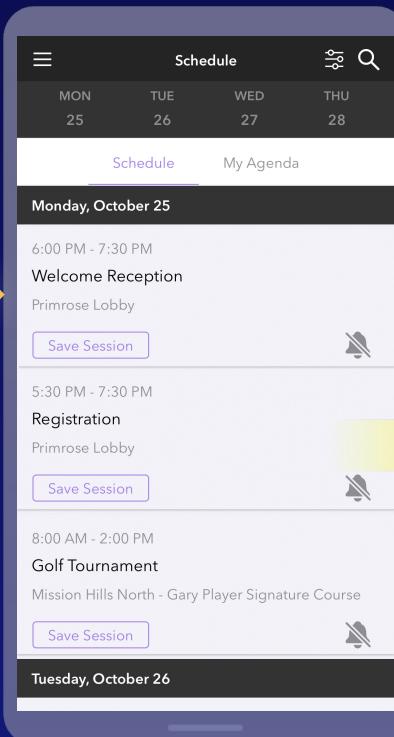
- ReactJS – [Create react app with TypeScript](#)
- [TypeScript](#)
- [ArcGIS Map SDK for JavaScript](#)
- [Calcite Components](#)
- [Instant App Components](#)
- [StencilJS](#)
- [ArcGIS Instant Apps](#)

Please Share Your Feedback in the App

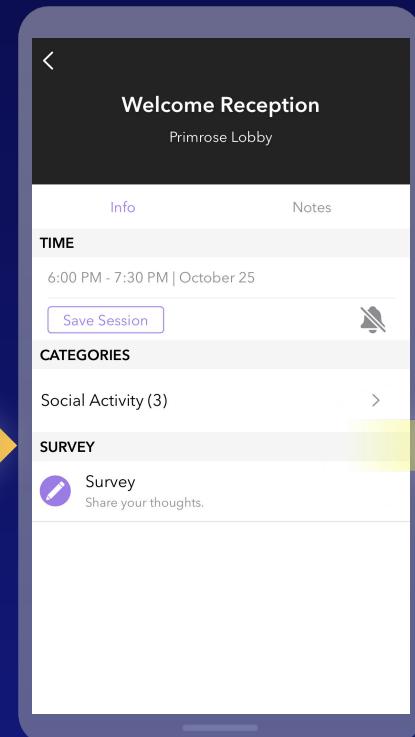
Download the Esri Events app and find your event



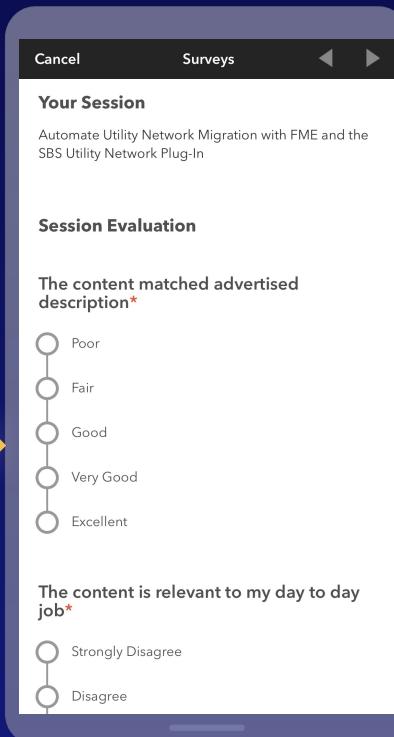
Select the session you attended



Scroll down to "Survey"



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-  github.com/Esri
-  github.com/EsriDevSummit
-  links.esri.com/EsriDevCommunity



Q&A

```
const view = new View({  
  container: "view",  
  map: map,  
  environment: {  
    lightings: {  
      directShadowsEnabled: true  
    }  
  }  
})
```

```
const layer = view.map.allLayers.get("layer");  
view.whenLayerView(layer)  
.then((layerView) => console.log(layerView))  
// if there were problems with the layer  
.catch(console.error);
```



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OF
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```
const layer = view.map.addLayer(  
  view.whenLayerView(layer)   
    .then(layerView => const  
      {  
        if (there were problems)  
          catch(console.error);  
      }  
    );  
  );
```

E/SCRIPT>

```
const view = new SceneView({  
  container: "viewDiv",  
  map: map,  
  environment: {  
    lighting: {  
      directional:  
    },  
  },  
});
```

LIVE
BY
THE
CODE