



ArcGIS Maps SDK for JavaScript: Leveraging the New Geometry Operators

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2025 ESRI DEVELOPER & TECHNOLOGY SUMMIT



ArcGIS Maps SDK for JavaScript: Leveraging the New Geometry Operators



[ADD TO SCHEDULE](#) Tuesday, Mar 11 | 3:15 PM - 3:45 PM PDT | (5:15 PM - 5:45 PM CDT) || Demo Theater 3: Mesquite D-E | PSCC

Introducing the new modular Geometry operators! Use the operators in the ArcGIS Maps SDK for JavaScript to perform client-side geometric analysis in your web apps. This evolution of the geometry engine introduces new capabilities and geometry types. In this demo theater, we'll demonstrate how the operators can be used to create interactive workflows that perform fast and complex geometric operations.

SPEAKERS



Noah Sager

Esri

Session Type: Demo Theater Presentation

Session Level: Intermediate

Access Type: In-Person

Topic: Web

Esri Products: ArcGIS Maps SDK for JavaScript

Capabilities: Web App Development

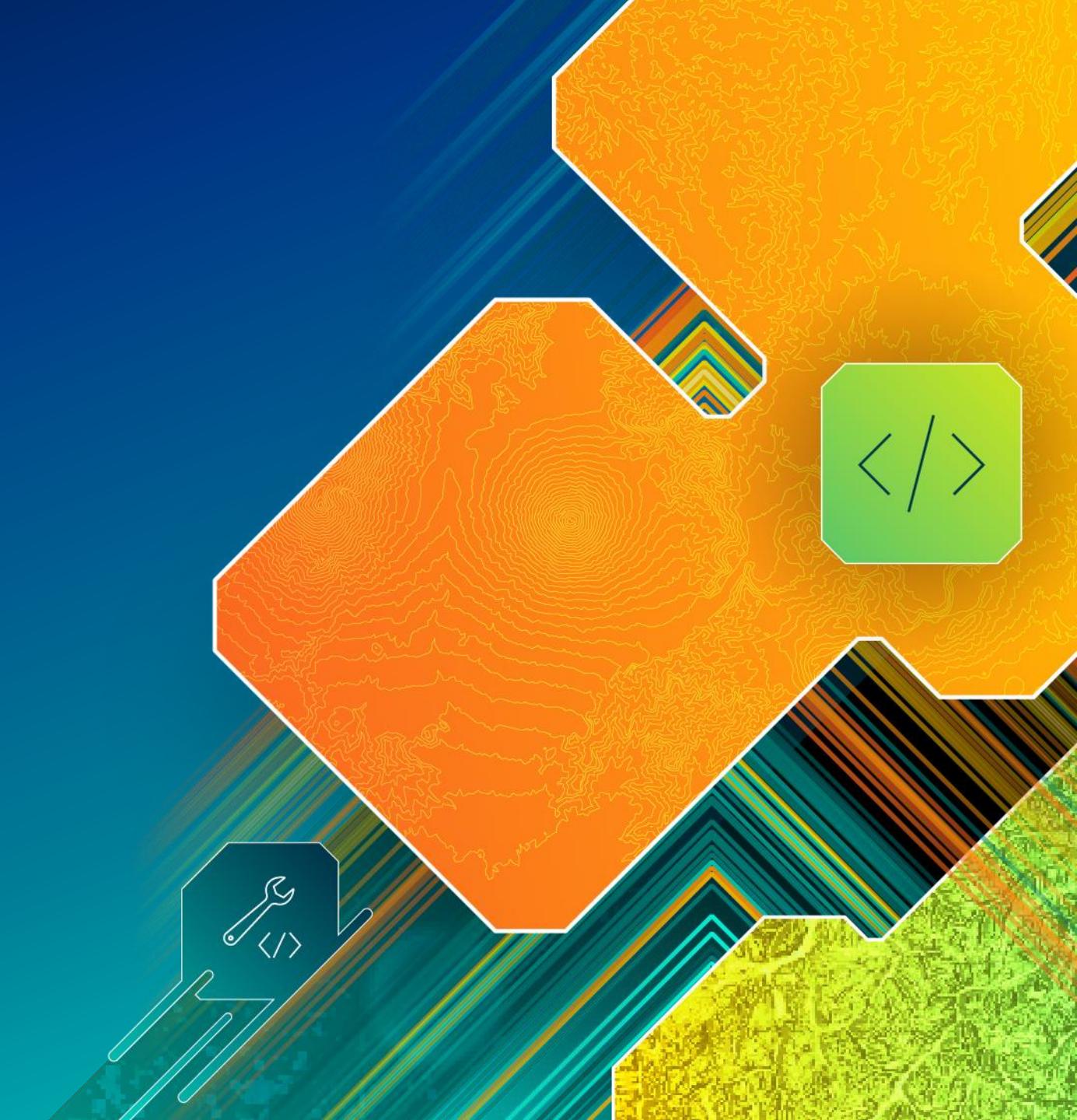
Technologies: Javascript

Keywords: JavaScript, geometric operators

Agenda

- Quick history
- Demos
- Questions

Quick history



4.31

Geometry operators (beta)

[Geometry operators](#) are now available in beta as an eventual replacement for the [geometryEngine](#), which provides functions for testing, measuring, and analyzing spatial relationships between two or more 2D geometries client-side.

4.32

Geometry operators

[Geometry operators](#) were introduced at 4.31 as the eventual replacement for the [geometryEngine](#), which provides functions for testing, measuring, and analyzing spatial relationships between two or more 2D geometries client-side. With this release they are **out of beta**.

geometryEngine

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

ESM: `import * as geometryEngine from "@arcgis/core/geometry/geometryEngine.js";`

Object: `esri/geometry/geometryEngine`

Since: ArcGIS Maps SDK for JavaScript 4.0

Deprecated since version 4.32. Use [goemetry_operators](#) instead.

Why?

Why?

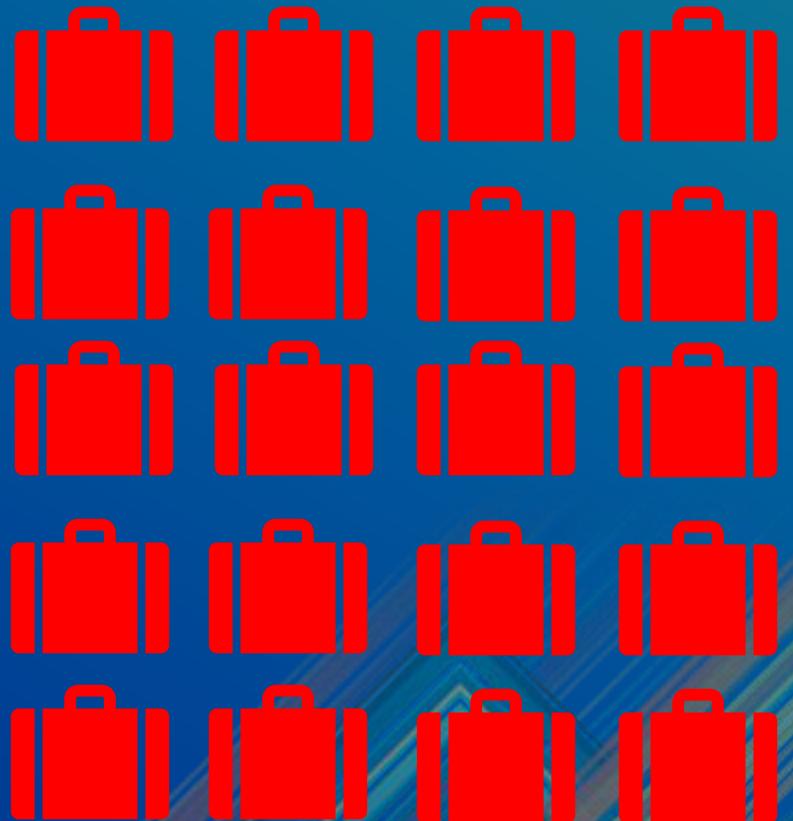
- 8 functional groups
- 20 new capabilities
- Independently imported

Why?

geometryEngine



Geometry operators

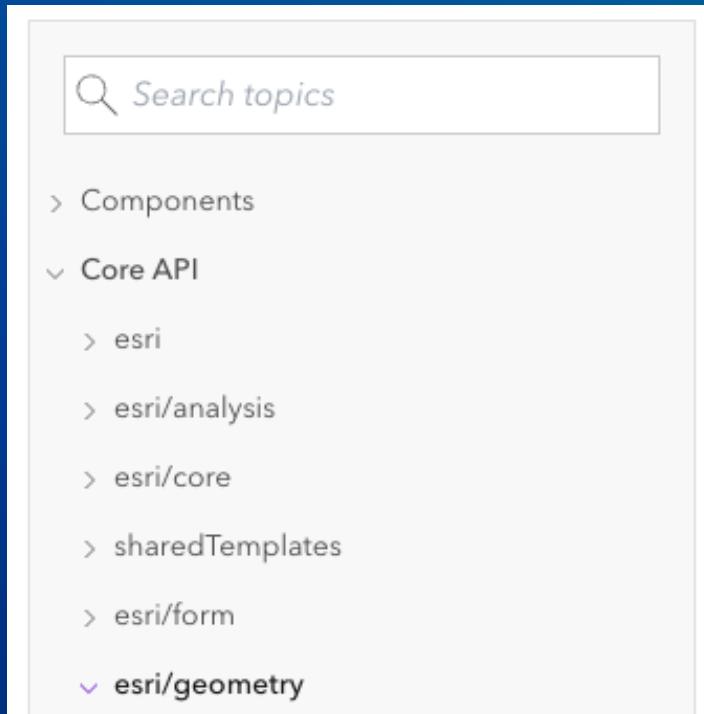


*assume infinite hands

Where?

Where?

Core API >> esri/geometry >> operators



 Search topics

▼ operators

affineTransformOperator

alphaShapeOperator

areaOperator

autoCompleteOperator

boundaryOperator

bufferOperator

centroidOperator

clipOperator

containsOperator

convexHullOperator

crossesOperator

cutOperator

densifyOperator

differenceOperator

disjointOperator

distanceOperator

equalsOperator

extendOperator

generalizeOperator

Where?

Core API >> esri/geometry >> operators

 Search topics

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convexHullOperator

crossesOperator

cutOperator

densifyOperator

differenceOperator

disjointOperator

distanceOperator

equalsOperator

extendOperator

generalizeOperator

Core AP

 Search topics

geodesicBufferOperator

geodesicProximityOperator

geodeticAreaOperator

geodeticDensifyOperator

geodeticDistanceOperator

geodeticLengthOperator

graphicBufferOperator

integrateOperator

intersectionOperator

intersectsOperator

isNearOperator

labelPointOperator

lengthOperator

linesToPolygonsOperator

locateBetweenOperator

minimumBoundingCircleOperator

multiPartToSinglePartOperator

offsetOperator

overlapsOperator

polygonOverlayOperator

>> operators

 Search topics

▼ operators

affineTransformOperator

alphaShapeOperator

areaOperator

autoCompleteOperator

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cutOperator

densifyOperator

differenceOperator

disjointOperator

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geodeticAreaOperator

geodeticDensifyOperator

geodeticDistanceOperator

geodeticLengthOperator

graphicBufferOperator

integrateOperator

intersectionOperator

intersectsOperator

isNearOperator

labelPointOperator

lengthOperator

linesToPolygonsOperator

locateBetweenOperator

minimumBoundingCircleOperator

multiPartToSinglePartOperator

offsetOperator

overlapsOperator

polygonOverlayOperator

>> ope

 Search topics

polygonSlicerOperator

projectOperator

proximityOperator

relateOperator

reshapeOperator

shapePreservingProjectOperator

simplifyOperator

symmetricDifferenceOperator

touchesOperator

unionOperator

withinOperator

▼ operators/support

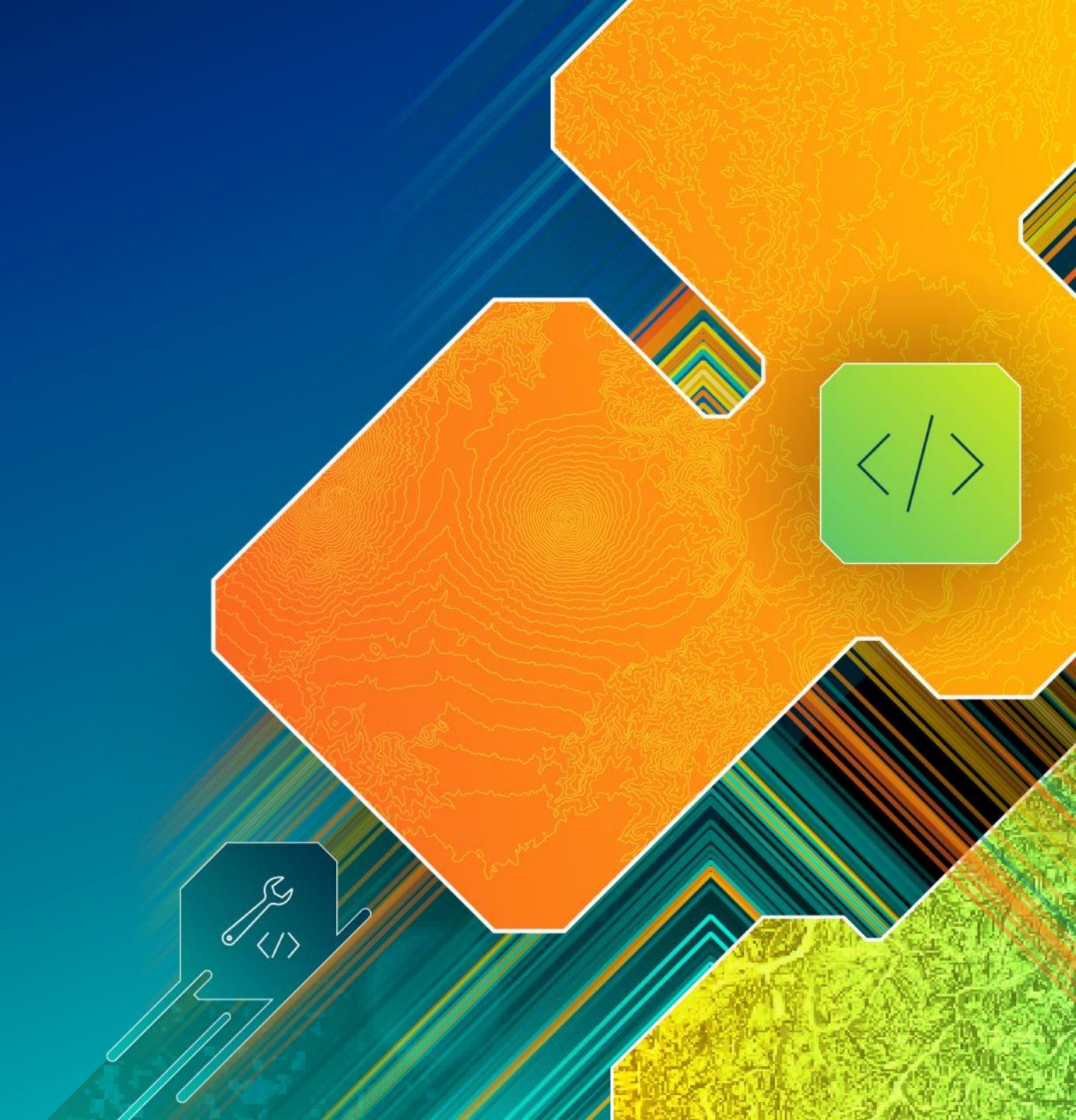
GeographicTransformation

GeographicTransformationStep

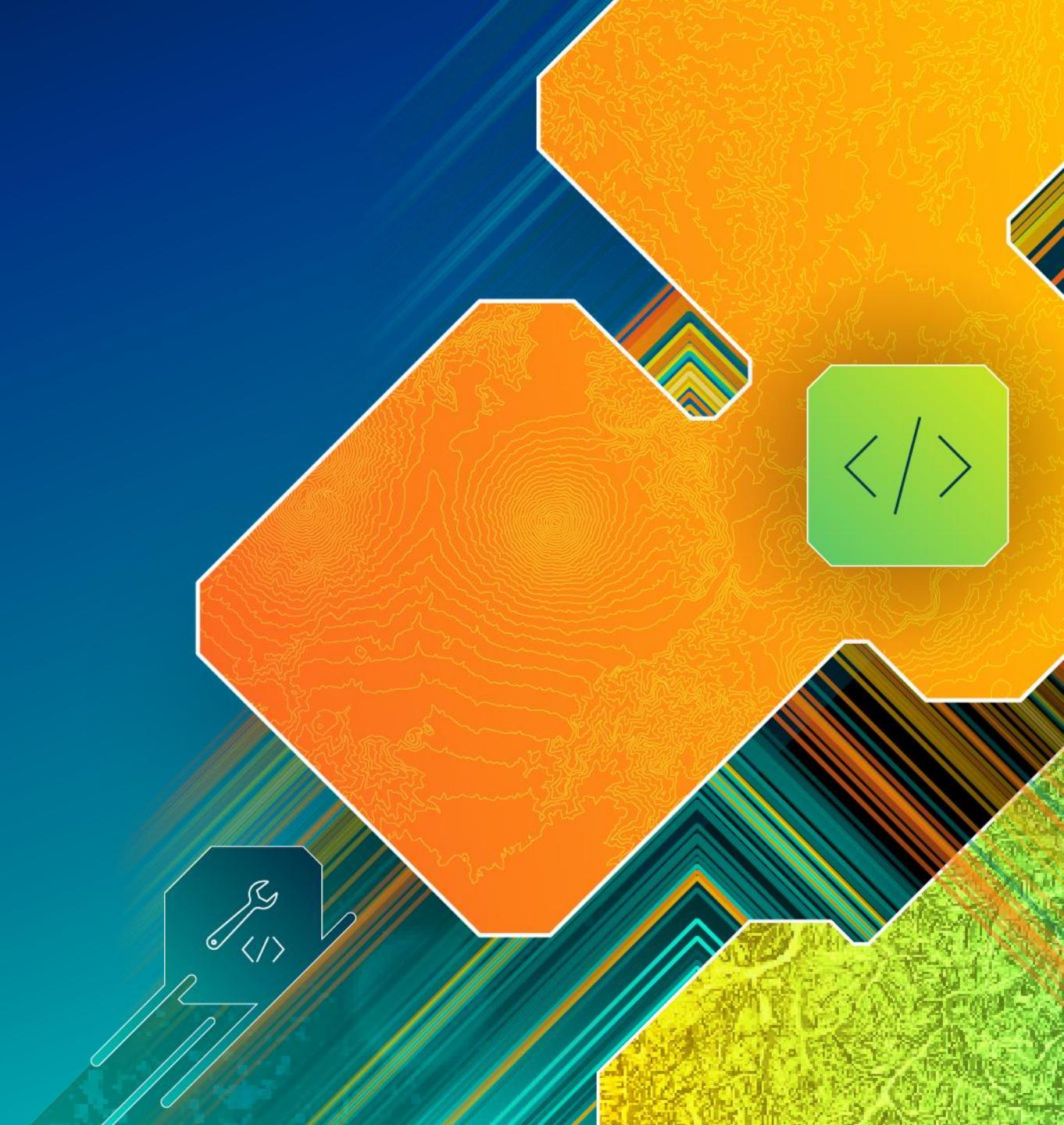
geographicTransformationUtils

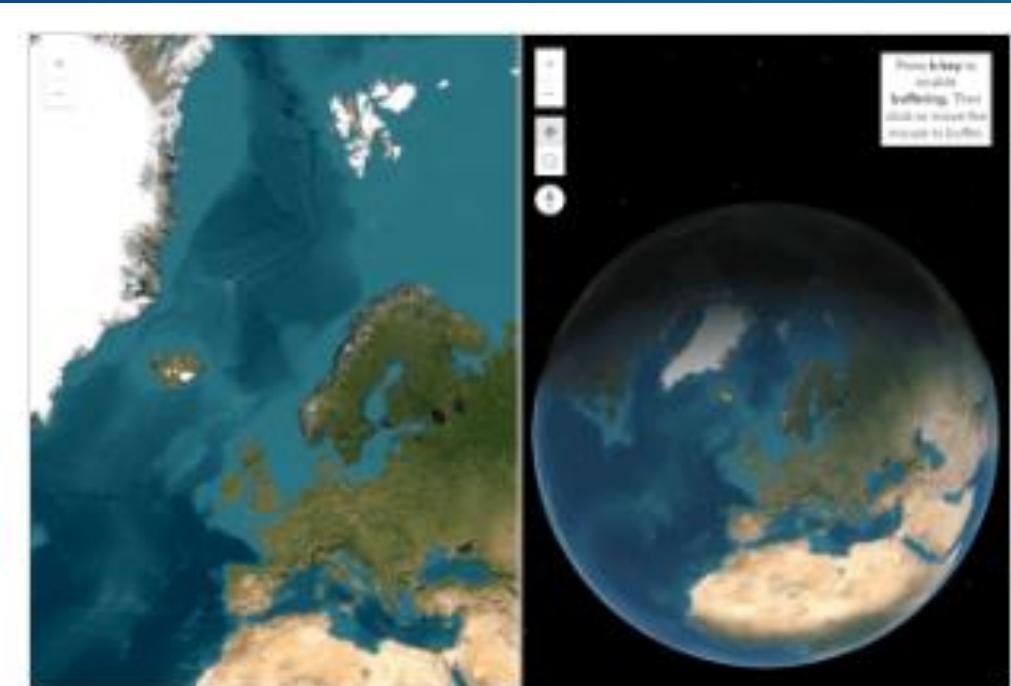
Transformation

Demos

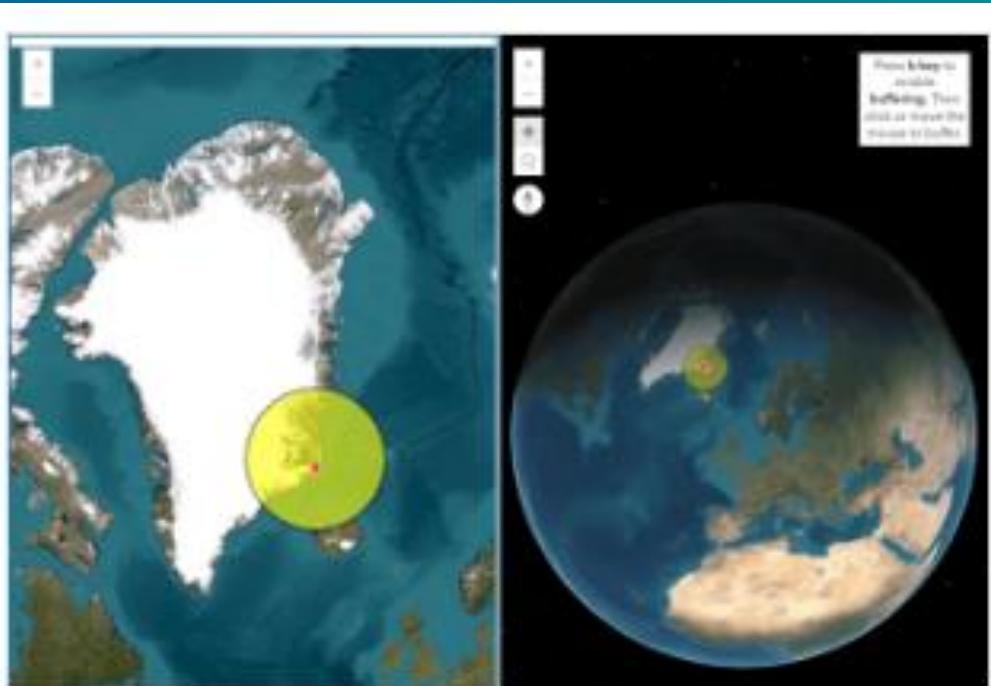


Bonus: Doc





GeometryEngine - geodesic buffers



Geometry operator - geodesic buffers

```
const buffer = geometryEngine.geodesicBuffer(point, 560, "kilometers");

if(bufferLayer.graphics.length === 0){
    bufferLayer.add(
        new Graphic({
            geometry: buffer,
            symbol: polySym
        })
    );
} else {
    const graphic = bufferLayer.graphics.getItemAt(0);
    graphic.geometry = buffer;
}
```

```
const buffer = geodesicBufferOperator.execute(point, 500, { unit: "kilometers" });

if (bufferLayer.graphics.length === 0) {
    bufferLayer.add(
        new Graphic({
            geometry: buffer,
            symbol: polySymbol
        })
    );
} else {
    const graphic = bufferLayer.graphics.getItemAt(0);
    graphic.geometry = buffer;
}
```

Introduction to geometry operators

The ArcGIS Maps SDK for JavaScript provides a variety of capabilities for performing client-side geometric operations on points, multipoints, lines, polygons and extents.

Categories

The geometry operators are grouped into nine functional categories: bounding, densify and generalize, feature to point, linear referencing, linear transformations, measurements, projection, spatial relationships, and topological operations.

<https://developers.arcgis.com/javascript/latest/spatial-analysis/intro-geometry-operators/>

Spatial analysis

- Introduction

Geometry operators

Tutorials

Find spatial relationships

Calculate geometries

Find length and area

Display projected geometries

Samples

Introduction to spatial analysis

With the [ArcGIS Maps SDK for JavaScript](#), you can perform spatial analyses. Spatial analysis is the process of using analytical techniques to find relationships, discover patterns, and solve problems with geographic data. The goal of every analysis is to turn data into information. Most analyses involve using your data as input, executing one or more operations, and then visualizing the output data on a map.



Introduction to spatial analysis

Spatial analysis allows you to discover patterns, find trends, and gain insights into your geospatial data.



Introduction to geometry operators

Geometry operators provide client-side capabilities for performing geometric calculations.

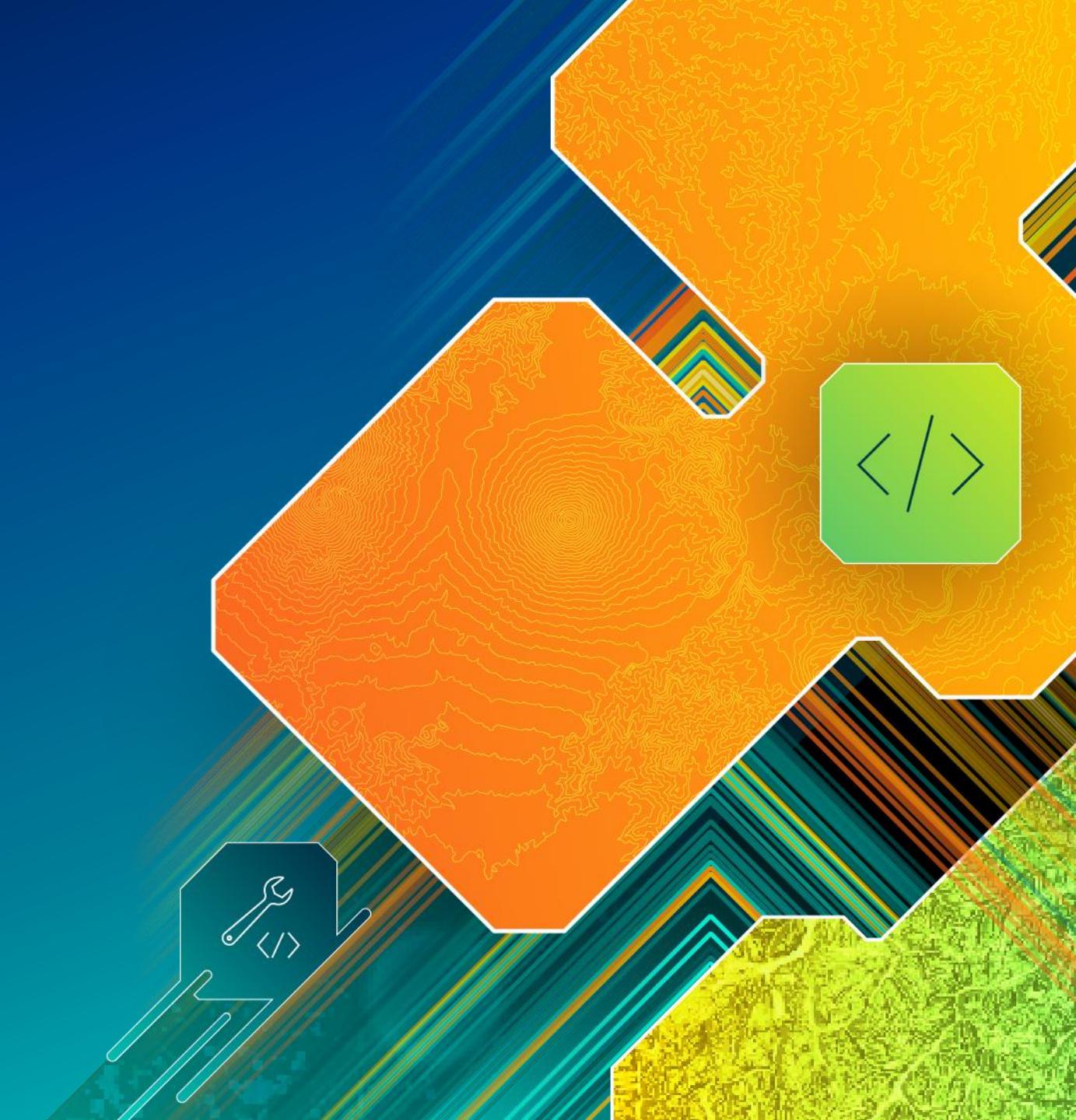


Geoprocessor

The Geoprocessor class provides access to ArcGIS Enterprise geoprocessing resources.

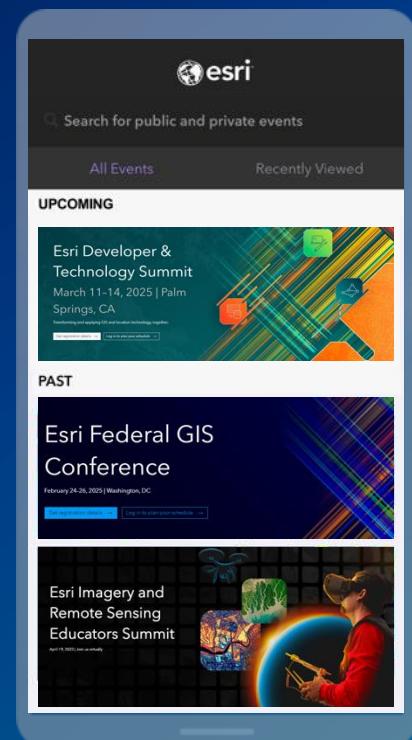
<https://developers.arcgis.com/javascript/latest/spatial-analysis/spatial-analysis-intro/>

Questions

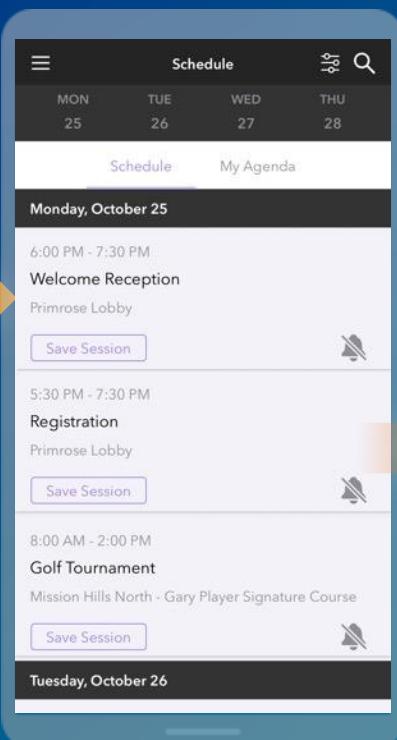


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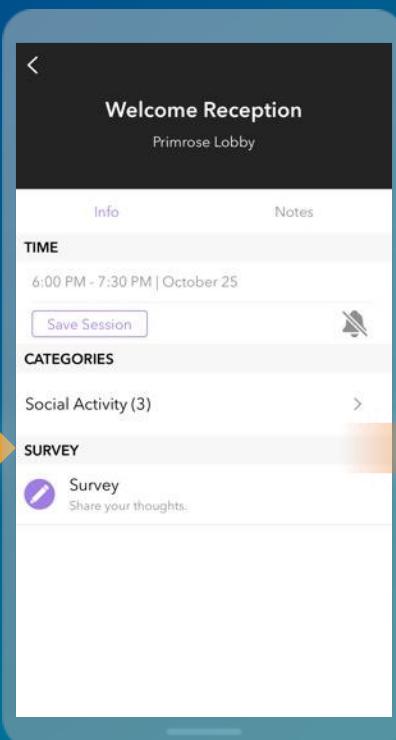
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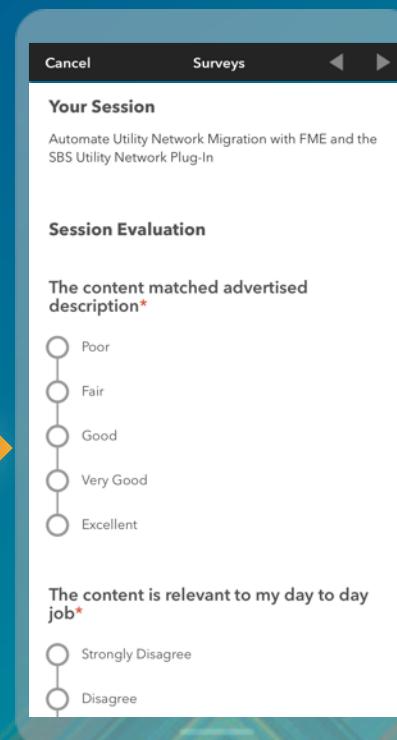
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Scroll down to "Survey"



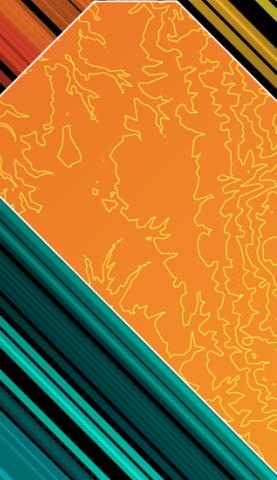
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[Add section title]



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Demo: [Add demo title]

