



Building Real Time Web Applications with GeoEvent Processor

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A decorative graphic consisting of a blue, 3D-style ribbon that weaves across the bottom half of the slide. The ribbon has several rectangular segments, some of which contain a white star. The background of the slide is a scenic view of Washington, DC, featuring the Washington Monument on the left, the Jefferson Memorial in the center, and cherry blossom trees in the foreground. The entire scene is reflected in the water of the Tidal Basin.

Esri Developer Summit
Washington, DC

Agenda

- **An example of how real-time streaming data could save your life**
- **Brief intro to Geoevent Processor**
- **Some useful GEP outputs (Feature Service, Web Sockets using JSON)**
- **Some web app components to consume them (FeatureLayer – with or without refresh, Stream Layer)**

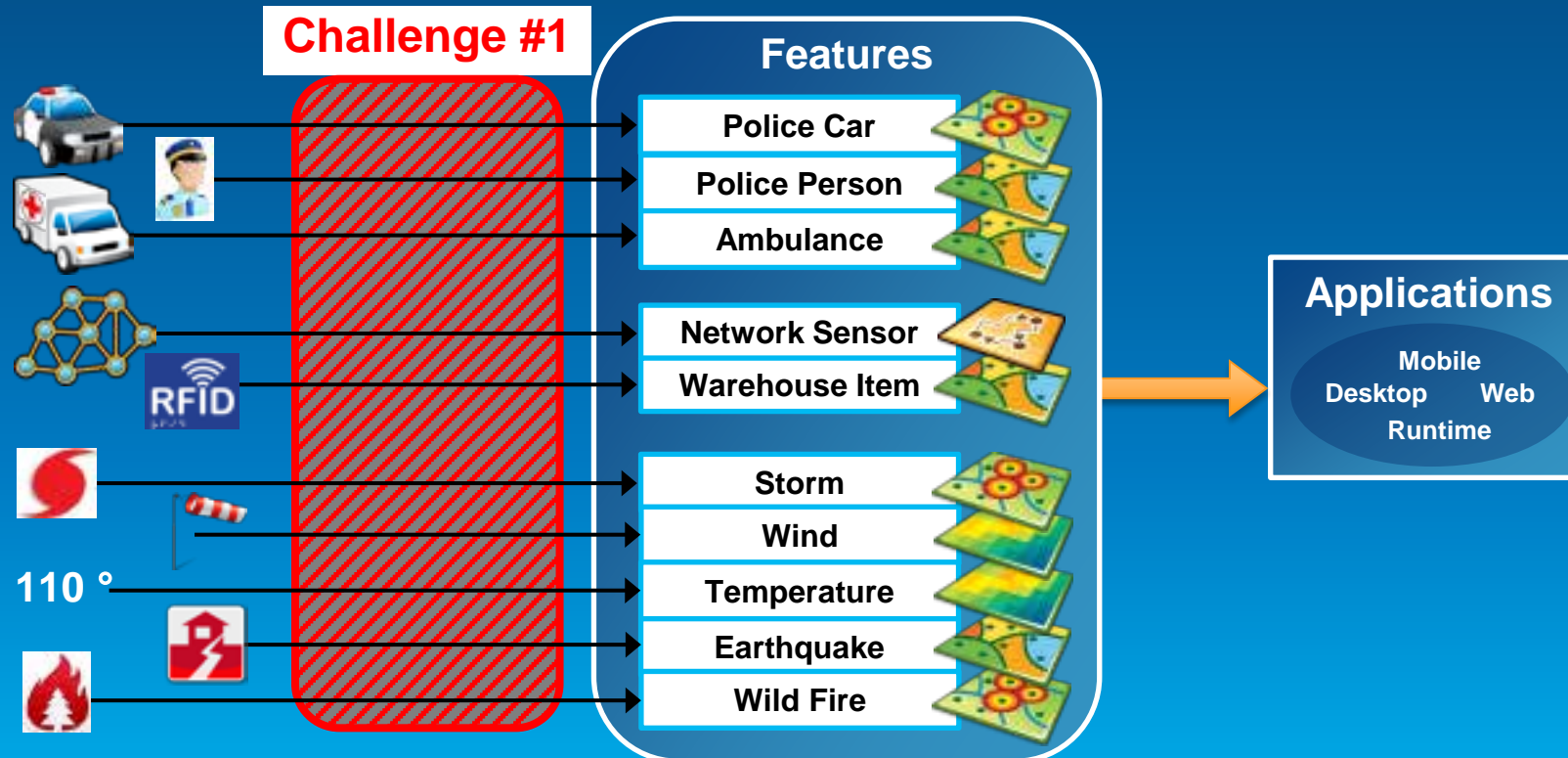
Demo

**How real-time streaming
GIS data will save
humanity and prevent
the downfall of
civilization as we know it**



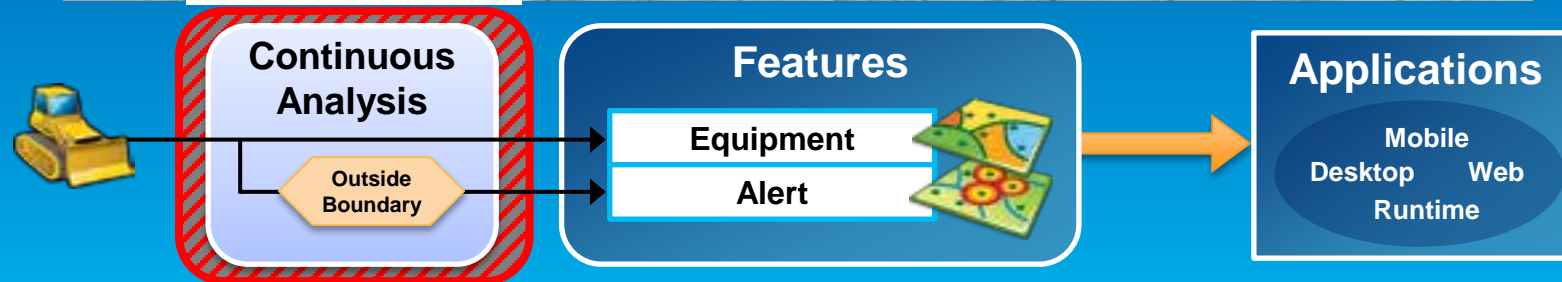
Real-time GIS data

- Real-time GIS data is a continuous stream of events flowing from sensors where each event represents the latest state of the sensor.
 - Emergency Response
 - Utility Networks and Warehouses
 - Environmental



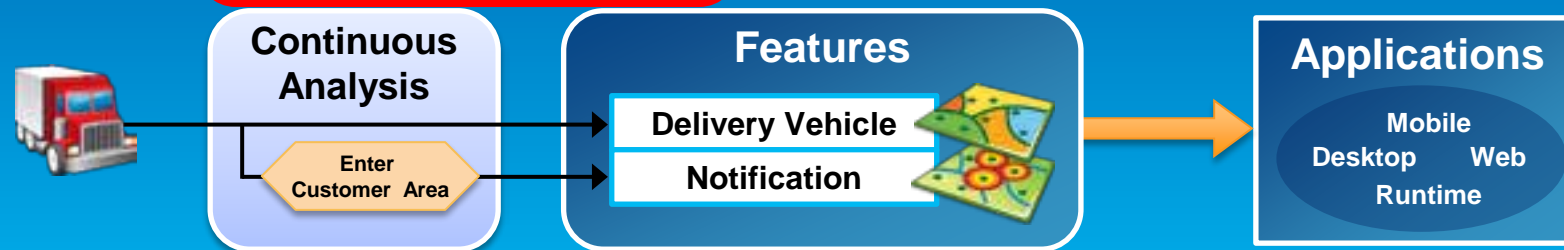
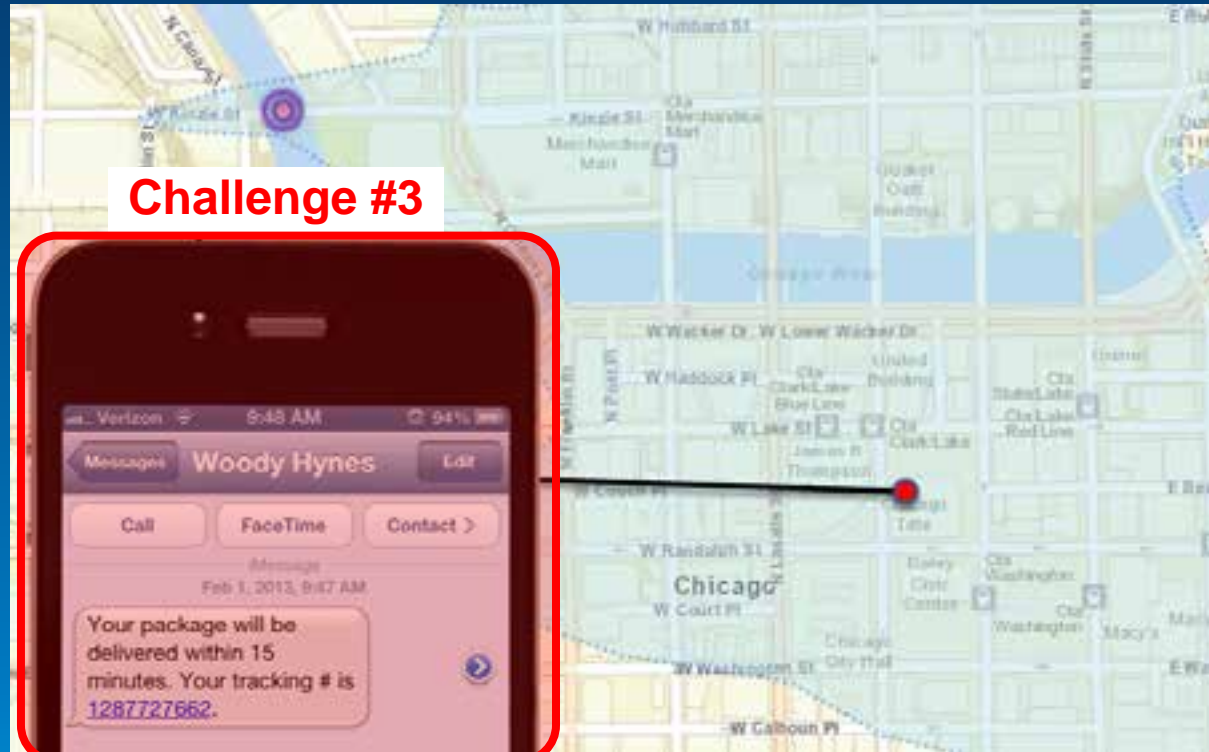
Analyzing real-time GIS data

- Are my field personnel working within the designated project area?



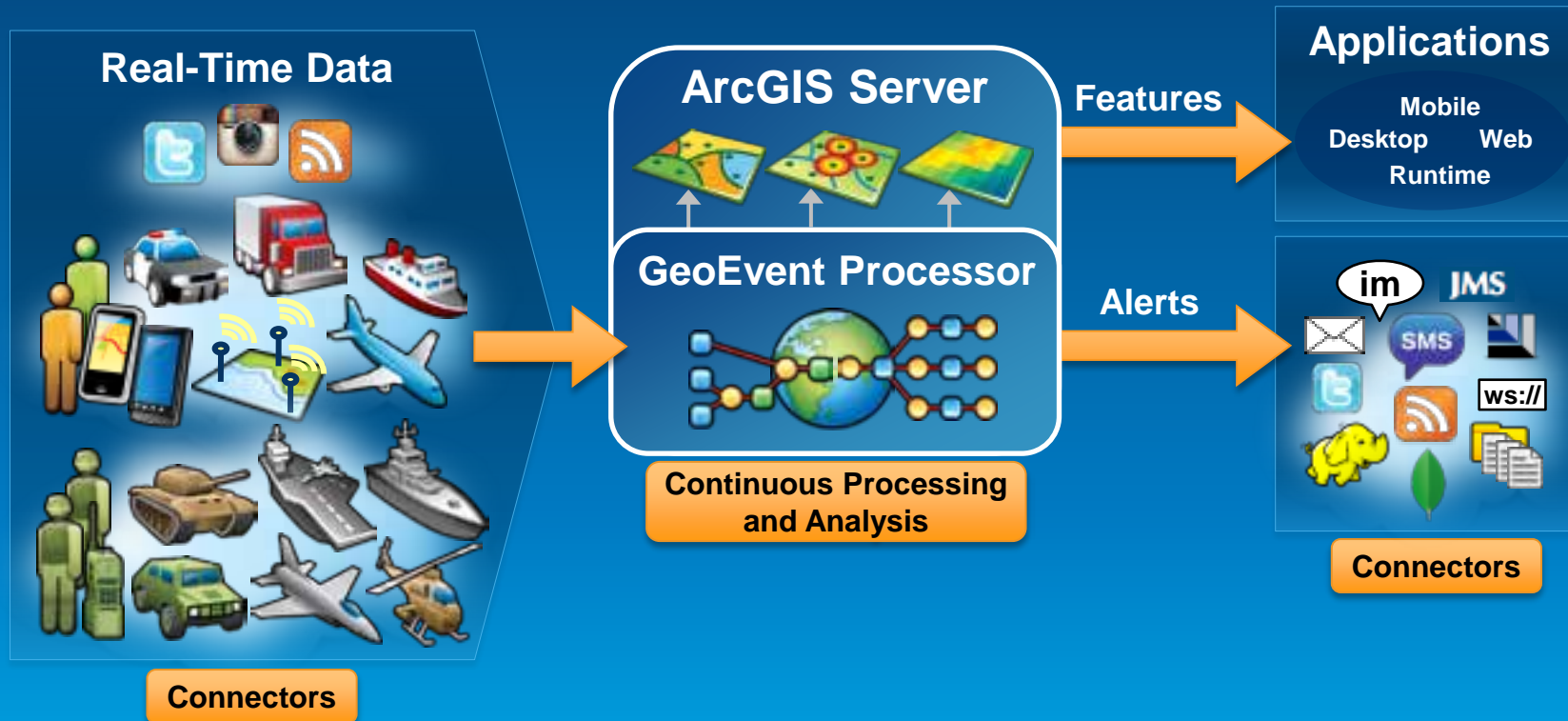
Analyzing real-time GIS data

- Tell customer when their delivery truck is 15 minutes away.



ArcGIS GeoEvent Processor for Server

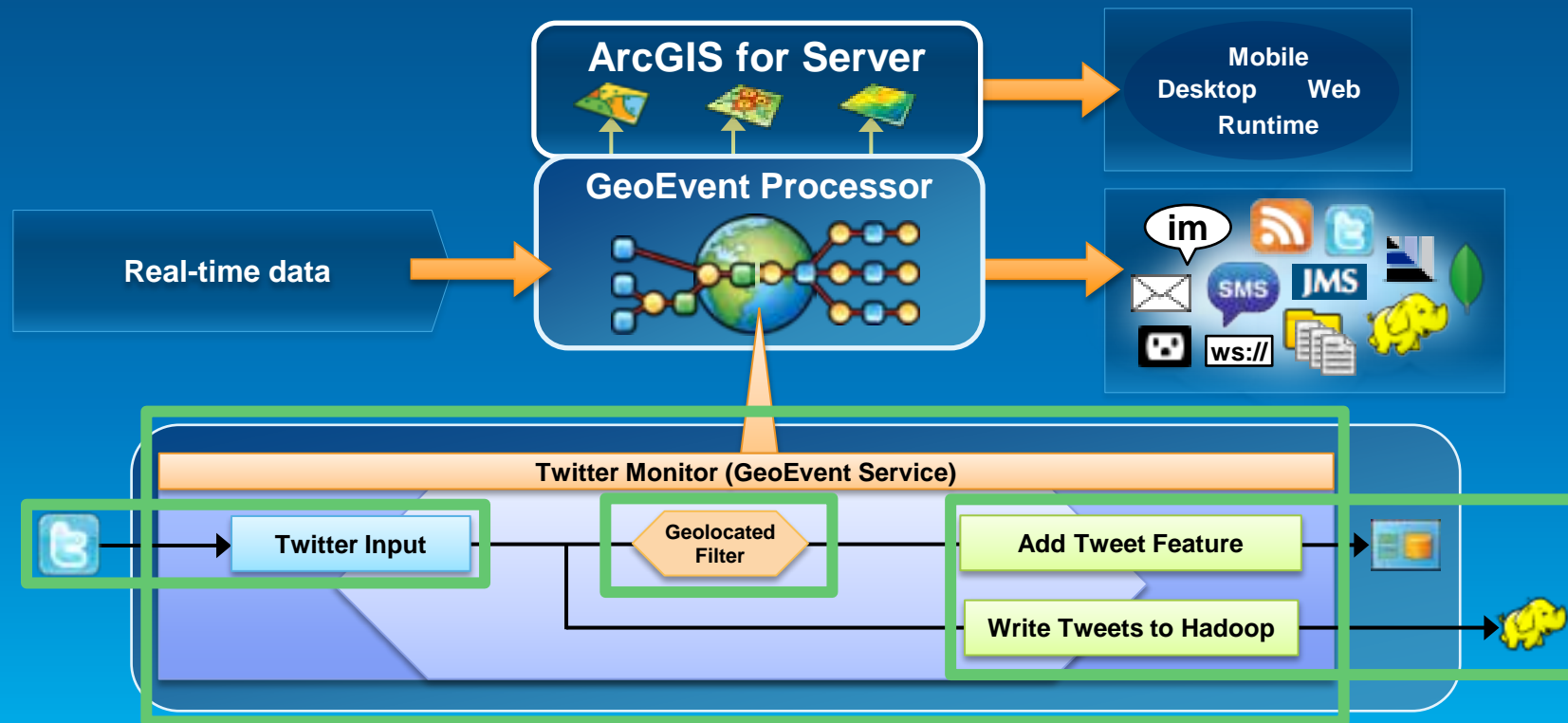
- Receives real-time streaming data
- Performs continuous processing and analysis
- Sends updates and alerts to those who need it where they need it



GeoEvent Services

Performing continuous processing and analysis

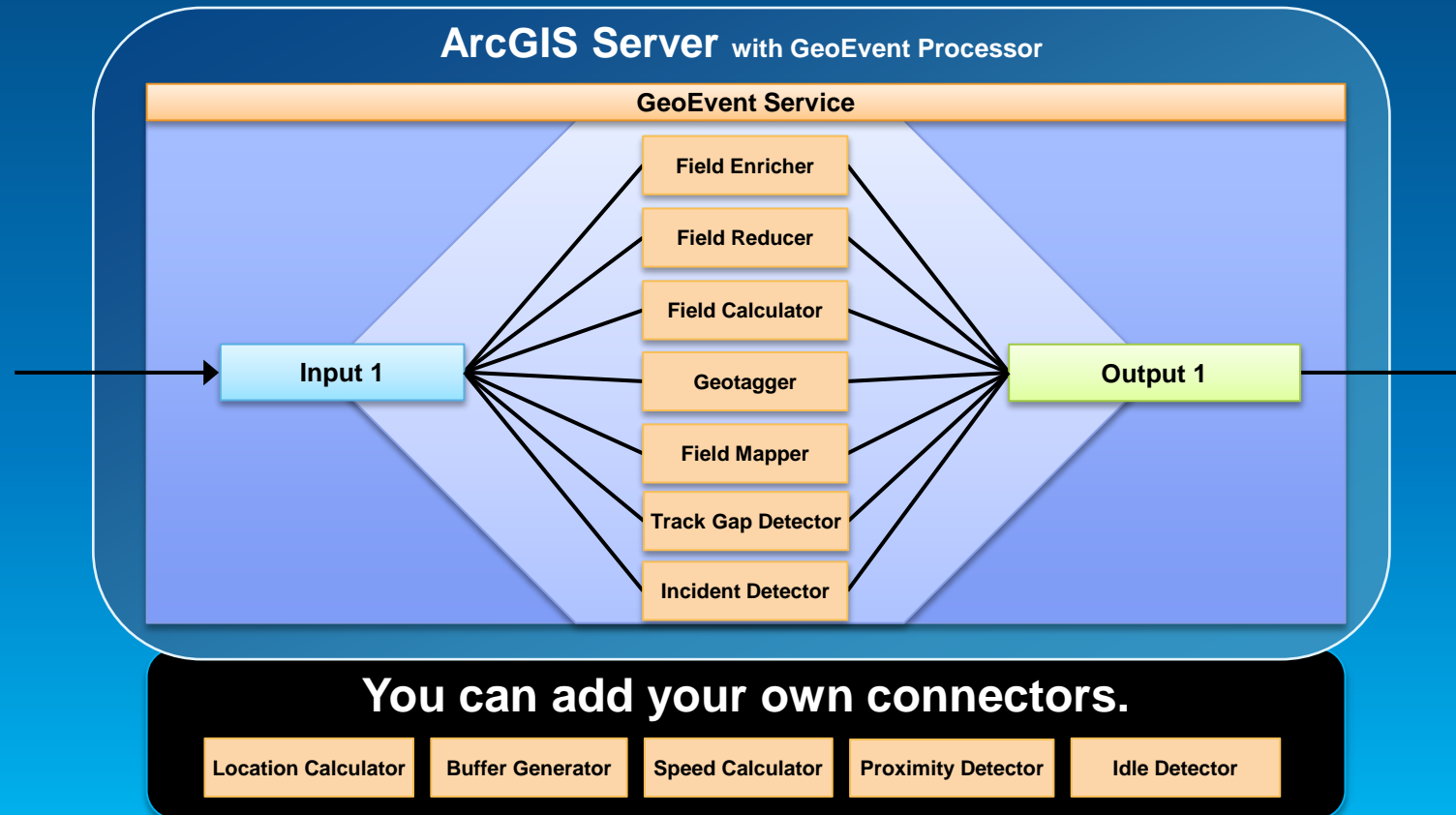
- A **GeoEvent Service** configures the flow of GeoEvents,
 - the **Filtering** and **GeoEvent Processing** steps to perform,
 - what input(s) to apply them to,
 - and what outputs(s) to send the results to.



Processors

Types of continuous processing and analysis

- Modify a geoevent: **Field Enricher, Field Reducer**
- Calculate new fields on a geoevent: **Field Calculator, GeoTagger**
- Derive a new geoevent: **Field Mapper, Incident Detector, Track Gap Detector, Idle Detector***

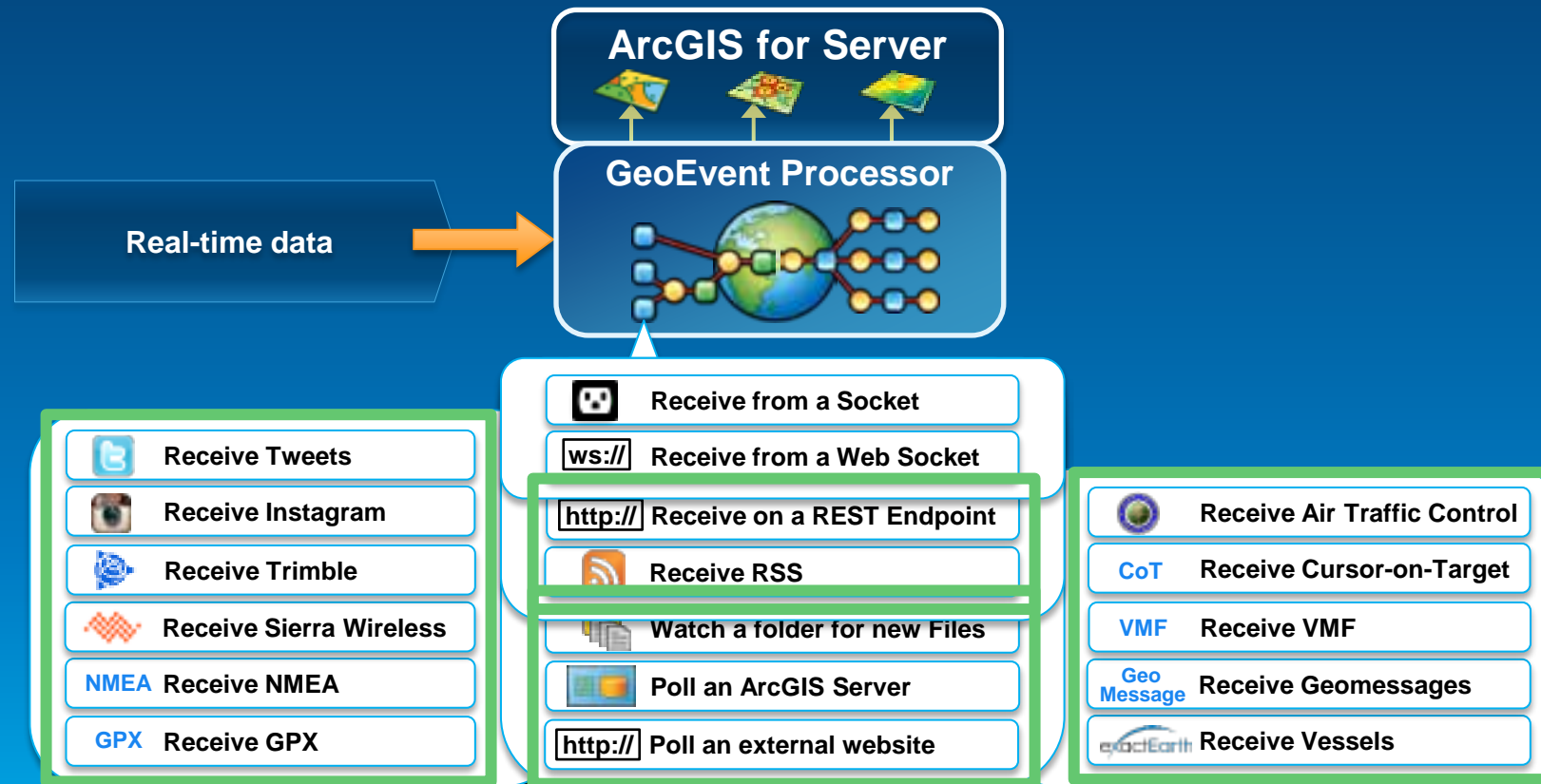


*coming soon

Receiving real-time data

Input connectors

- You can easily integrate real-time data with ArcGIS by using a **connector** that meets your needs.

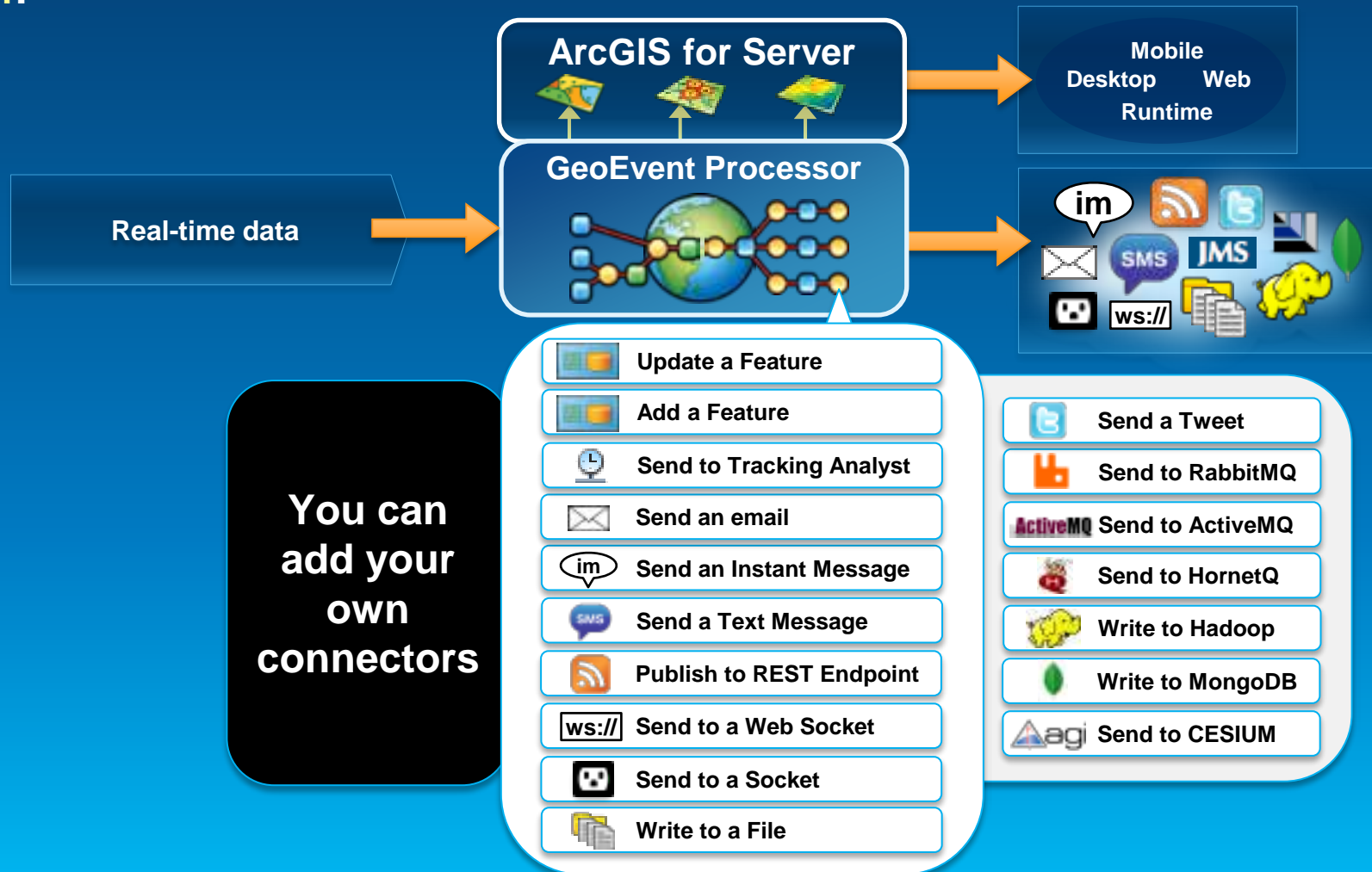


You can add your own connectors.

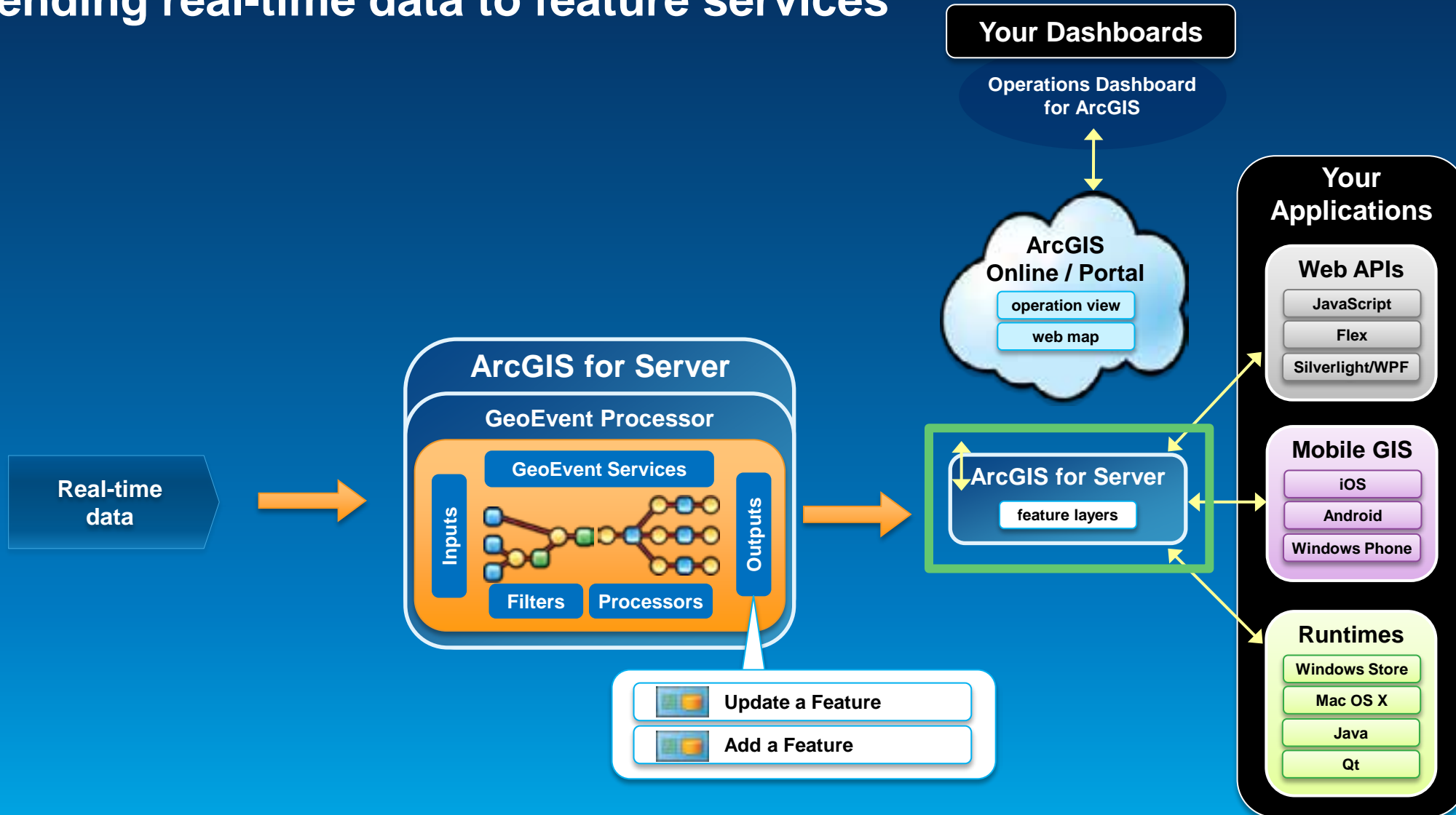
Sending real-time data

Output connectors

- You can easily send resulting streams to those who need it where they need it using a **connector**.

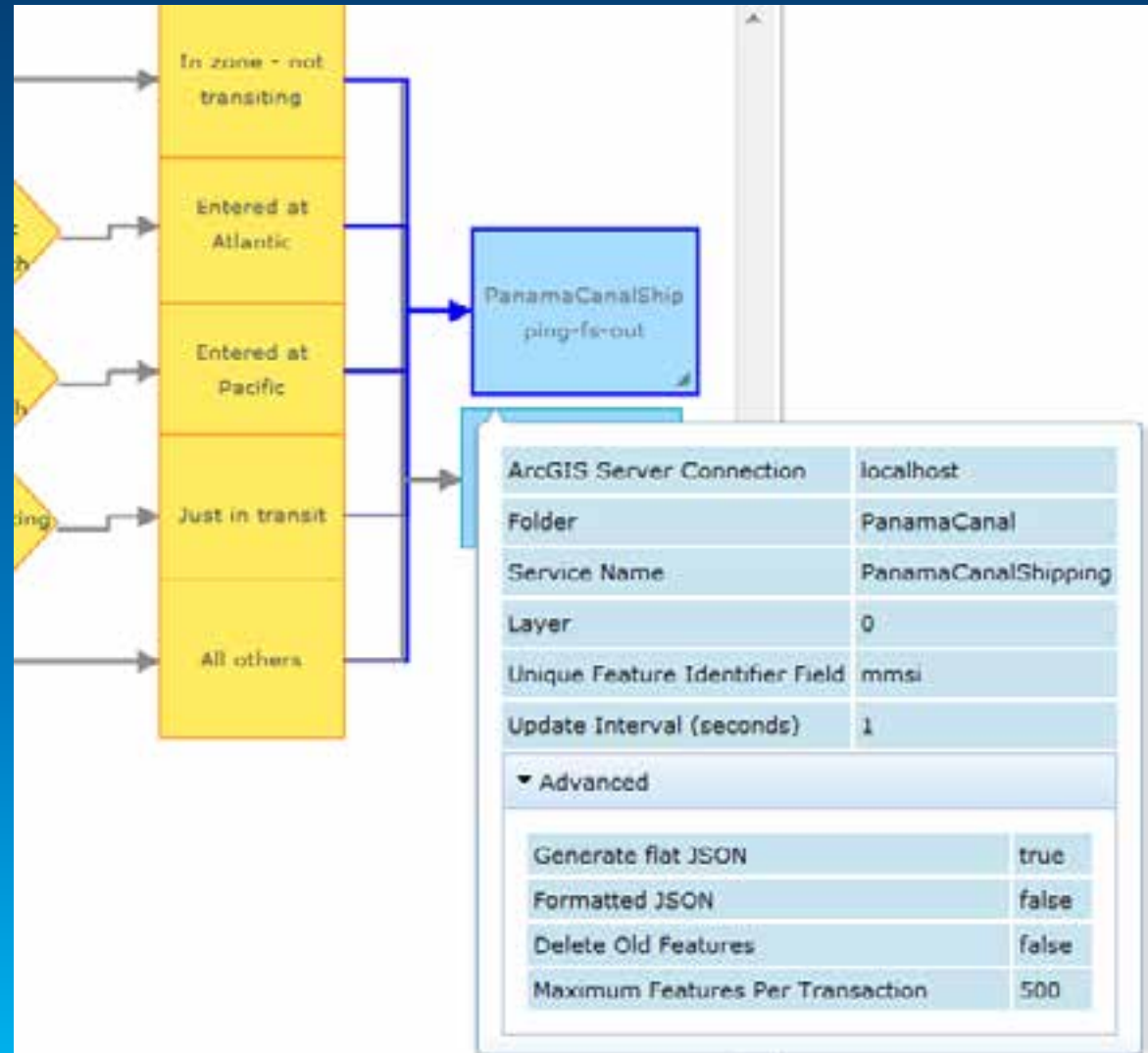


Sending real-time data to feature services



From GeoEvent Processor to Web App via Feature Service

- Set up the output from GeoEvent Processor
 - 'Update a Feature' Connector
 - FeatureService Transport
 - JSON Adapter



From GeoEvent Processor to Web App via Feature Service

- Use `FeatureLayer` in your app
 - Configure `Url`, `Renderer`, `Popup Content`, etc

```
var southCarolinaCounties = new
esri.layers.FeatureLayer("http://sampleserver1.arcgisonline.com/ArcGIS/rest/services/Demographics/ESRI_Census_US
A/MapServer/3", {
  mode: esri.layers.FeatureLayer.MODE_SNAPSHOT,
  outFields: ["NAME", "POP2000", "POP2007", "POP00_SQMI", "POP07_SQMI"]
});
southCarolinaCounties.setDefinitionExpression("STATE_NAME = 'South Carolina'");
```

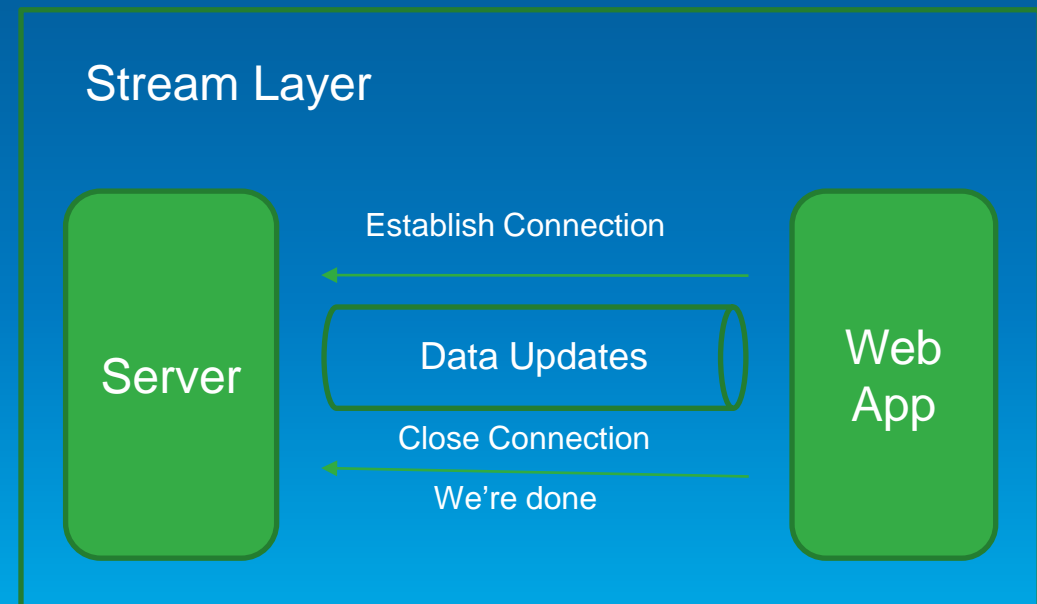
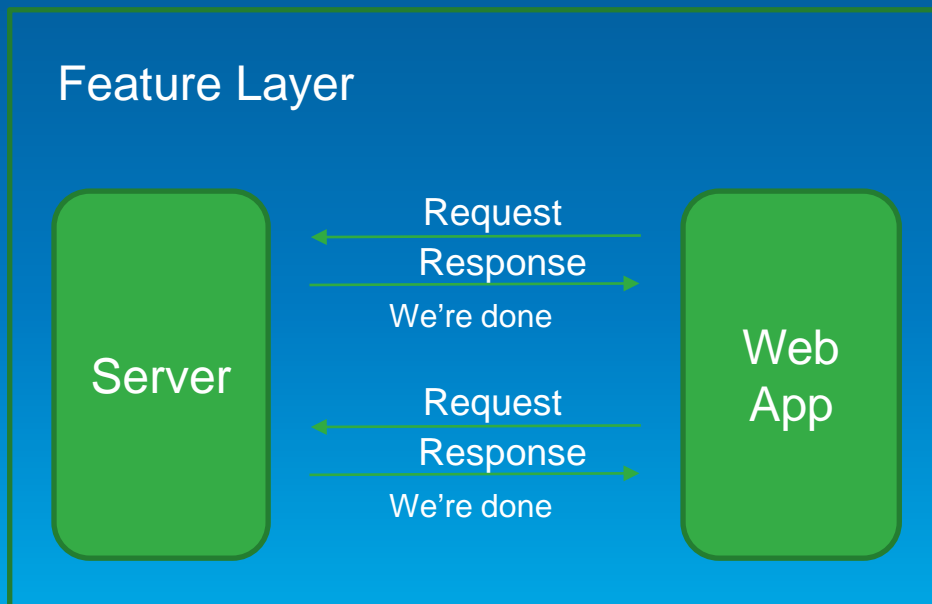
What's a Stream Layer?

Hint: It has nothing to do with hydrology maps

- **ArcGIS API for JavaScript layer type**
- **Inherits from FeatureLayer**
- **No stateless http requests to get snapshots of data**
- **Persistent connection via Web Sockets**
- **Receives data through pushes**

Stream Layer - Advantages

- **More efficient transfer of data.**
 - Only negotiate a connection once.
 - Messages sent without extra headers
- **Avoids need to poll for data updates**



From GeoEvent Processor to Web App via WebSockets

- Set up the output from GeoEvent Processor
 - WebSocket Transport
 - JSON Adapter

Editing Connector - stream-layer-output

Name:

Label:

Description:

Type: Input Output

Adapter:

Transport:

Default Output Name:

Configure Properties

Shown Properties

- URL Path
- Update Interval (seconds)

Advanced Properties

From GeoEvent Processor to Web App via WebSockets

- Use StreamLayer in your app
 - Use Feature Collection to define data schema (From GeoEvent Definition)
 - Supply WebSocket connection url (From Output)

```
streamLayer = new StreamLayer( featureCollection, {
  socketUrl: 'ws://geoeventsample3.esri.com:8080/satelliteservice',
  purgeOptions: { displayCount: 1000 }
});

var timeExtent = new esri.TimeExtent();
var now = new Date();
timeExtent.endTime = now;
timeExtent.startTime = dojo.date.add(timeExtent.endTime, "hour", -7);
streamLayer.setTimeDefinition(timeExtent);
```

```
| map = new Map("mapDiv", {
  basemap: "national-geographic",
  center: [-122.33, 47.6],
  zoom: 2
});

var featureCollection = {
  layerDefinition: {
    geometryType: "esriGeometryPoint",
    objectIdField: "id",
    fields: [{
      name: "id",
      alias: "id",
      type: "esriFieldTypeOID"
    }]
  },
  featureSet: {
    features: [],
    geometryType: "esriGeometryPoint"
  }
}
```

Useful Links

- **WebSocket Information**

- <http://www.websocket.org>

- **Stream Layer documentation**

- <https://developers.arcgis.com/javascript/jsapi/streamlayer-amd.html>



Understanding our world.