



# ESRI DEVELOPER SUMMIT

10-12 November | Berlin, Germany



# ArcGIS GeoEvent Extension for Server: An Introduction

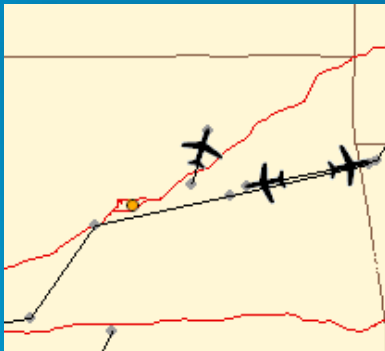
Christine Wiltawsky

# What is Real-Time GIS?



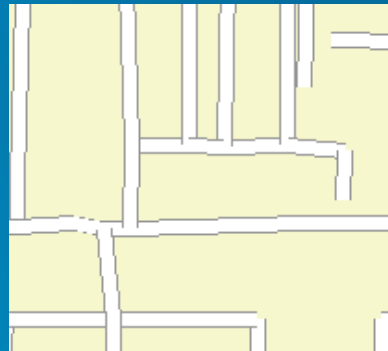
# Real-Time Data

## Dynamic Spatial movements



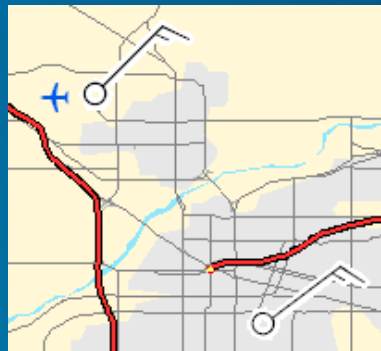
- Planes
- UAV
- Vessels
- Animals
- Hurricanes

## Discrete Something happening somewhere



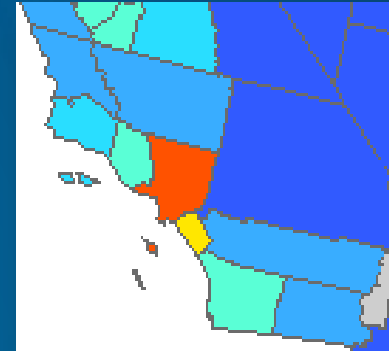
- Crime
- Thunder
- Accidents

## Stationary Spatially fixed



- Weather Station
- Traffic
- Air Quality
- Wind Turbine
- Smart Meter
- Water Gauges

## Variable Temporal changes

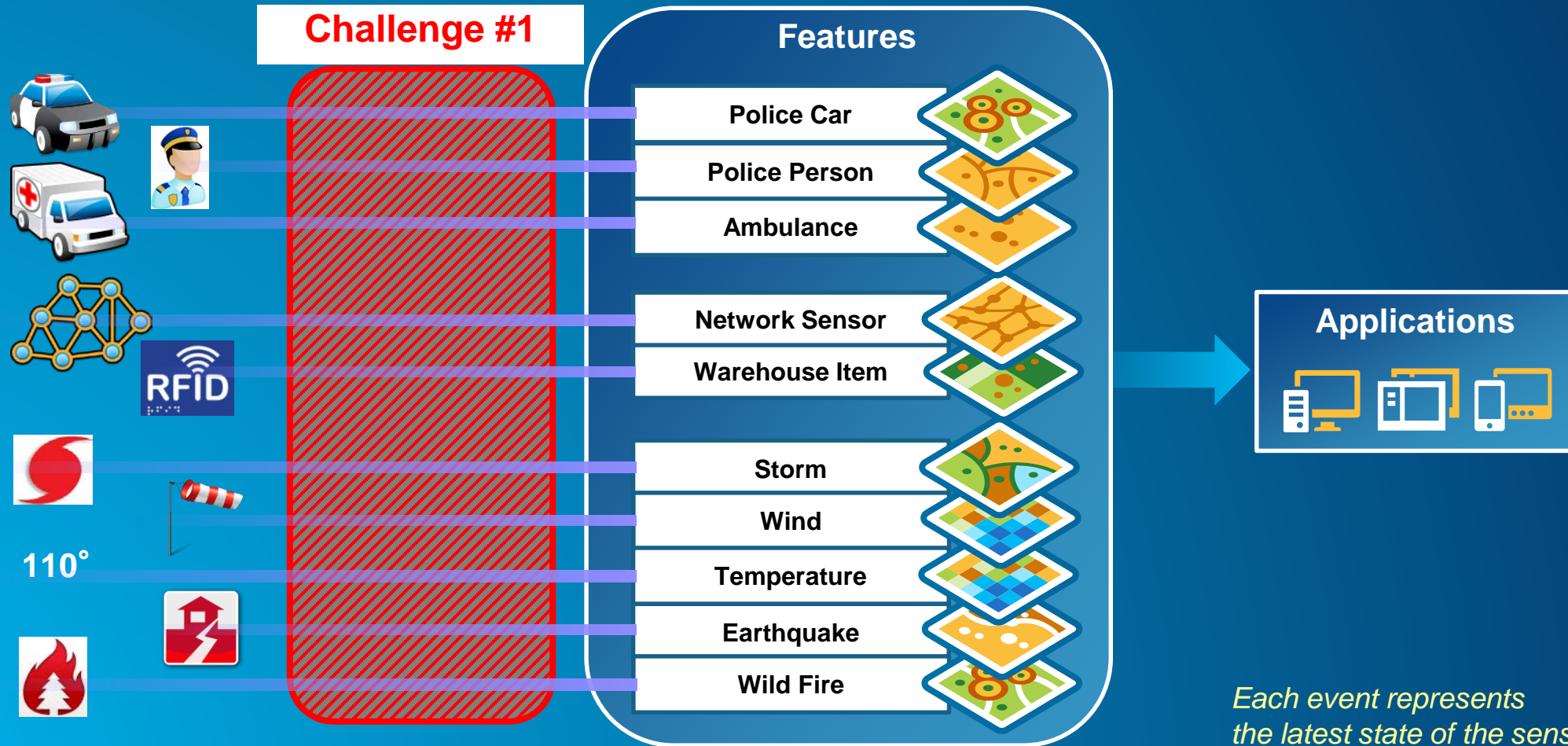


- Population
- Agriculture
- Disease
- Elections



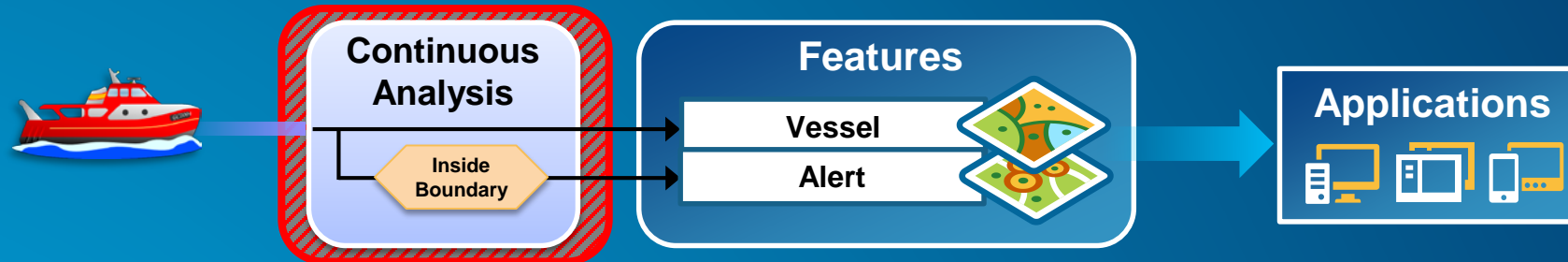
# Real-Time GIS Data

*Continuous stream of events flowing from a data feed*

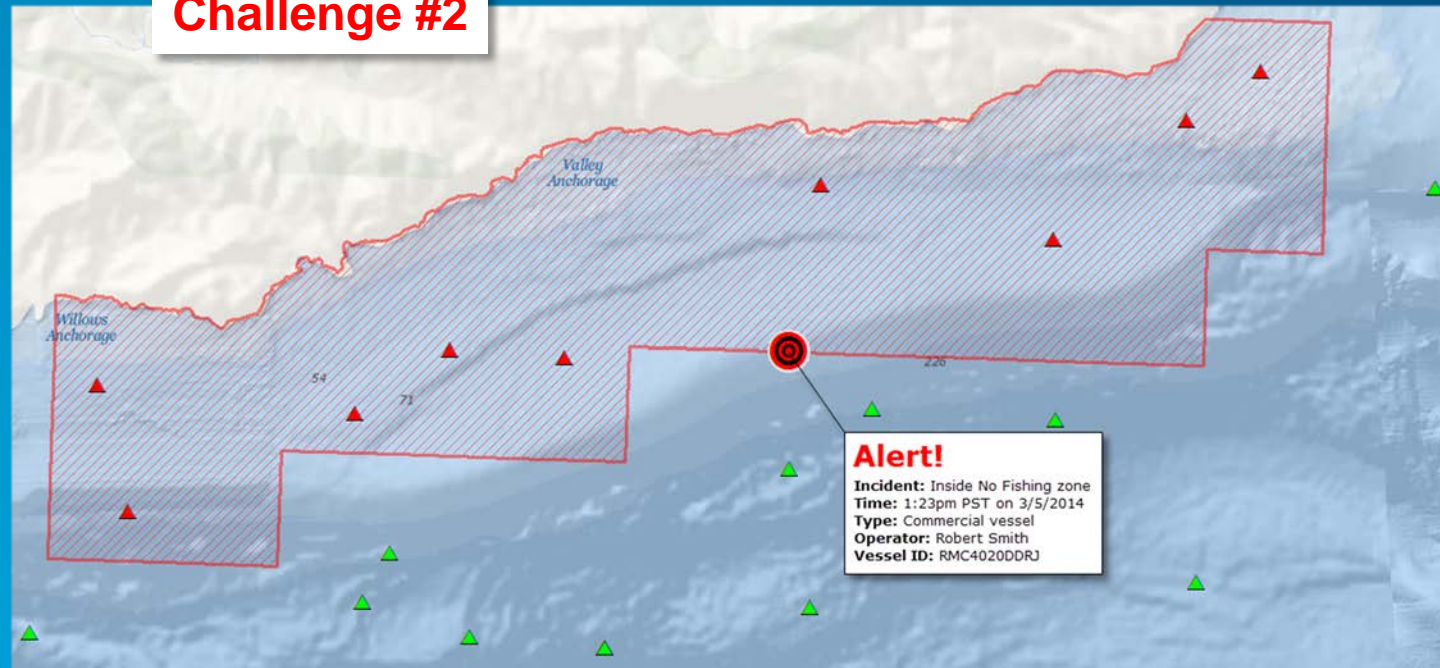


# Real-Time Analytics

What fishing vessels are inside designated 'no fishing' zones?

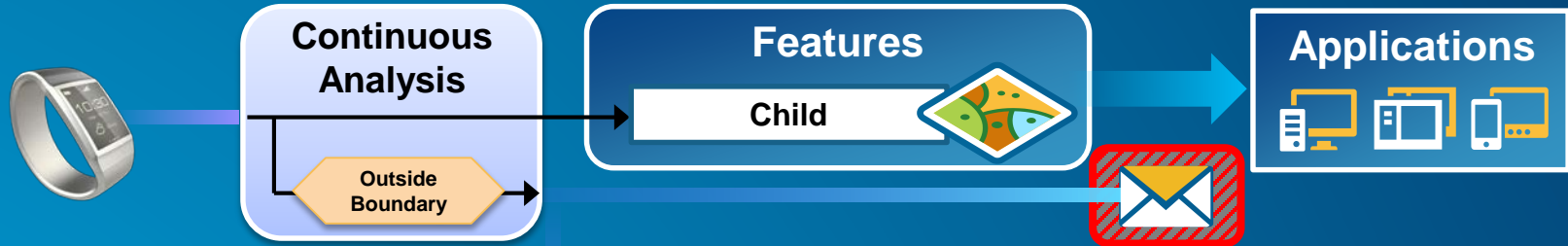


**Challenge #2**



# Real-Time Notifications and Alerting

*Tell a parent when their child leaves school property*



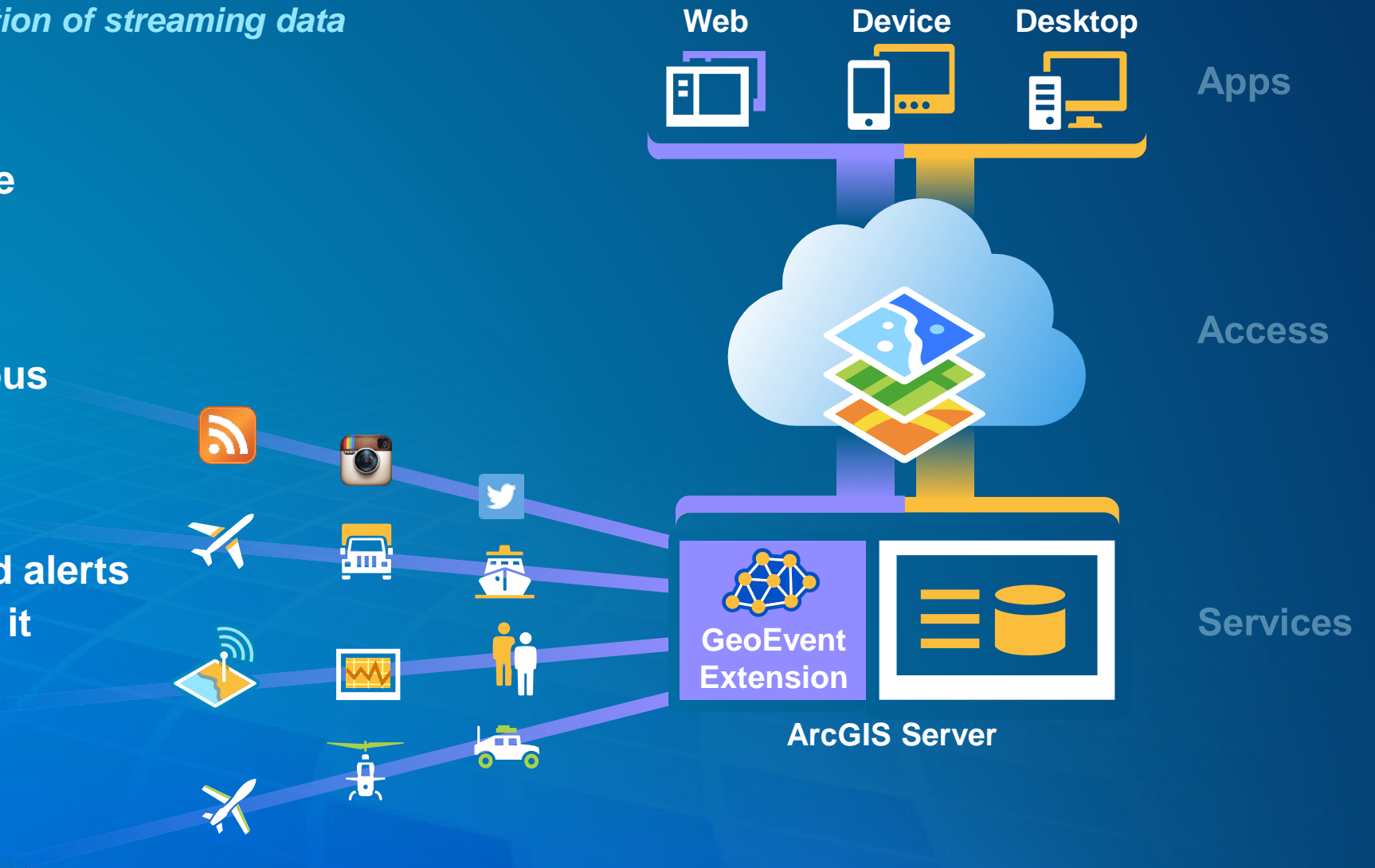
This section shows a map of a neighborhood with a red dashed line outlining a school property. A red target icon is placed on the map. A red-bordered box with "SMS" written inside is positioned over the map. Below the map is a smartphone screen displaying a text message. The message header reads "Alert" and "Contact". The message body says: "iMessage Today 1:12 PM ALERT! Your child has left school property. Click [here](#) to show their current location." A red dot on the map is connected to the "here" link in the message. In the top right corner of this section, the text "Challenge #3" is written in red.



# Real-Time GIS

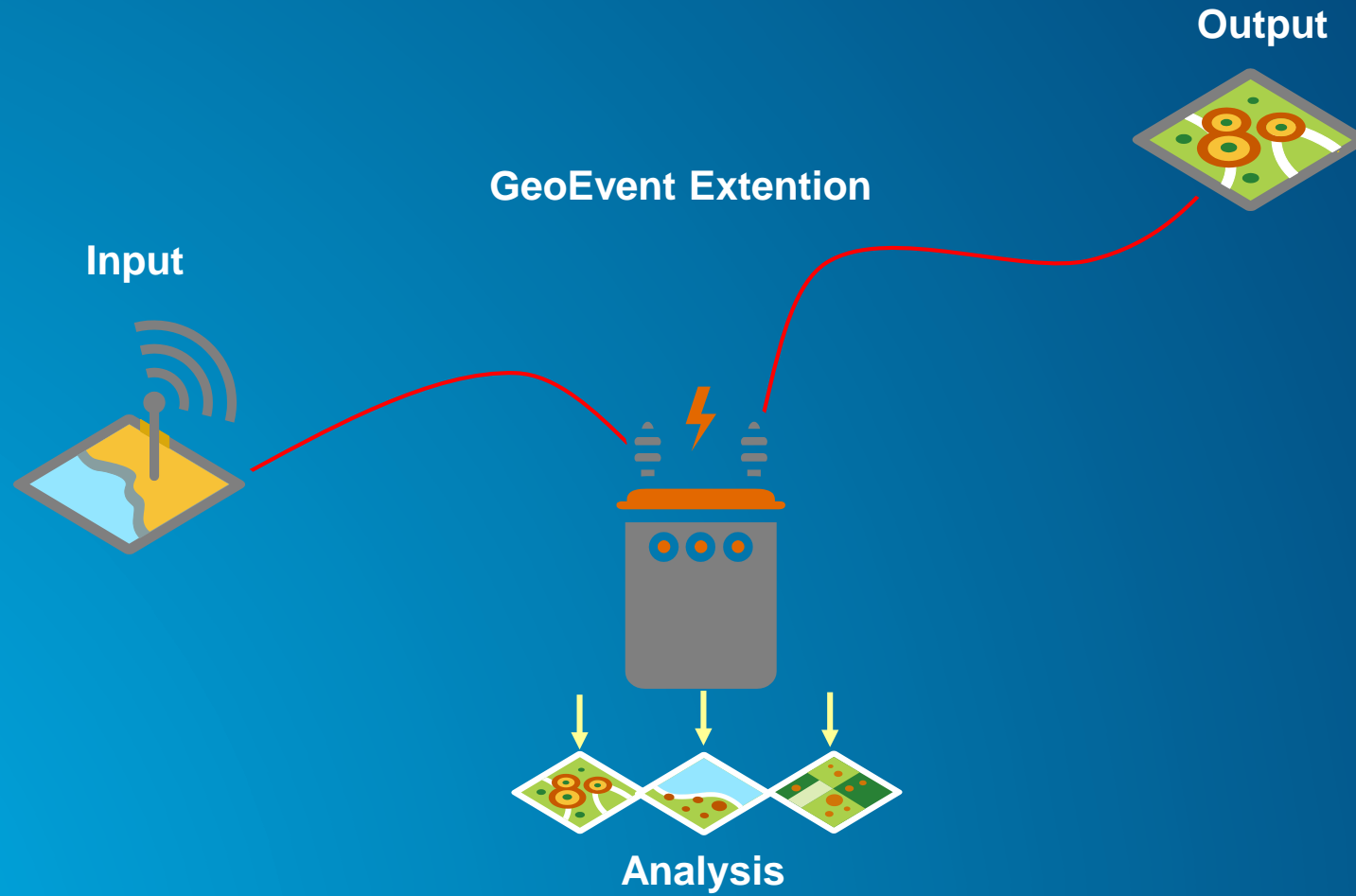
*Integration and exploitation of streaming data*

- Integrates real-time streaming data into ArcGIS
- Performs continuous processing and real-time analytics
- Sends updates and alerts to those who need it where they need it



# Working with Real-Time Data

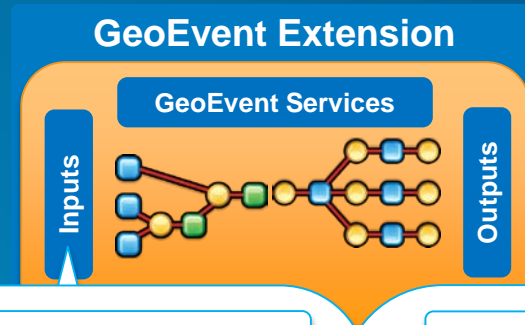
# Working with Real-Time Data



# How do I get my real-time data into ArcGIS?









Easily integrate real-time streaming data into ArcGIS using an Input Connector

- Use an existing connector
















You can create your own connectors.

## Out of the Box

-  Poll an ArcGIS Server for Features
-  Poll an external website for GeoJSON, JSON, or XML
-  Receive Features, GeoJSON, JSON, or XML on a REST endpoint
-  Receive GeoJSON or JSON on a WebSocket
-  Receive RSS
-  Receive Text from a TCP or UDP Socket
-  Subscribe to an external WebSocket for GeoJSON or JSON
-  Watch a Folder for New CSV or JSON Files

## Esri Gallery

-  ActiveMQ
-  CAP
-  CoT Cursor-on-Target
-  esd Exploitation Support Data
-  GeoMessage
-  Instagram
-  KML
-  Kafka \*
-  NMEA 0183
-  RabbitMQ \*
-  Sierra Wireless (RAP)
-  Trimble (TAIP)
-  Twitter

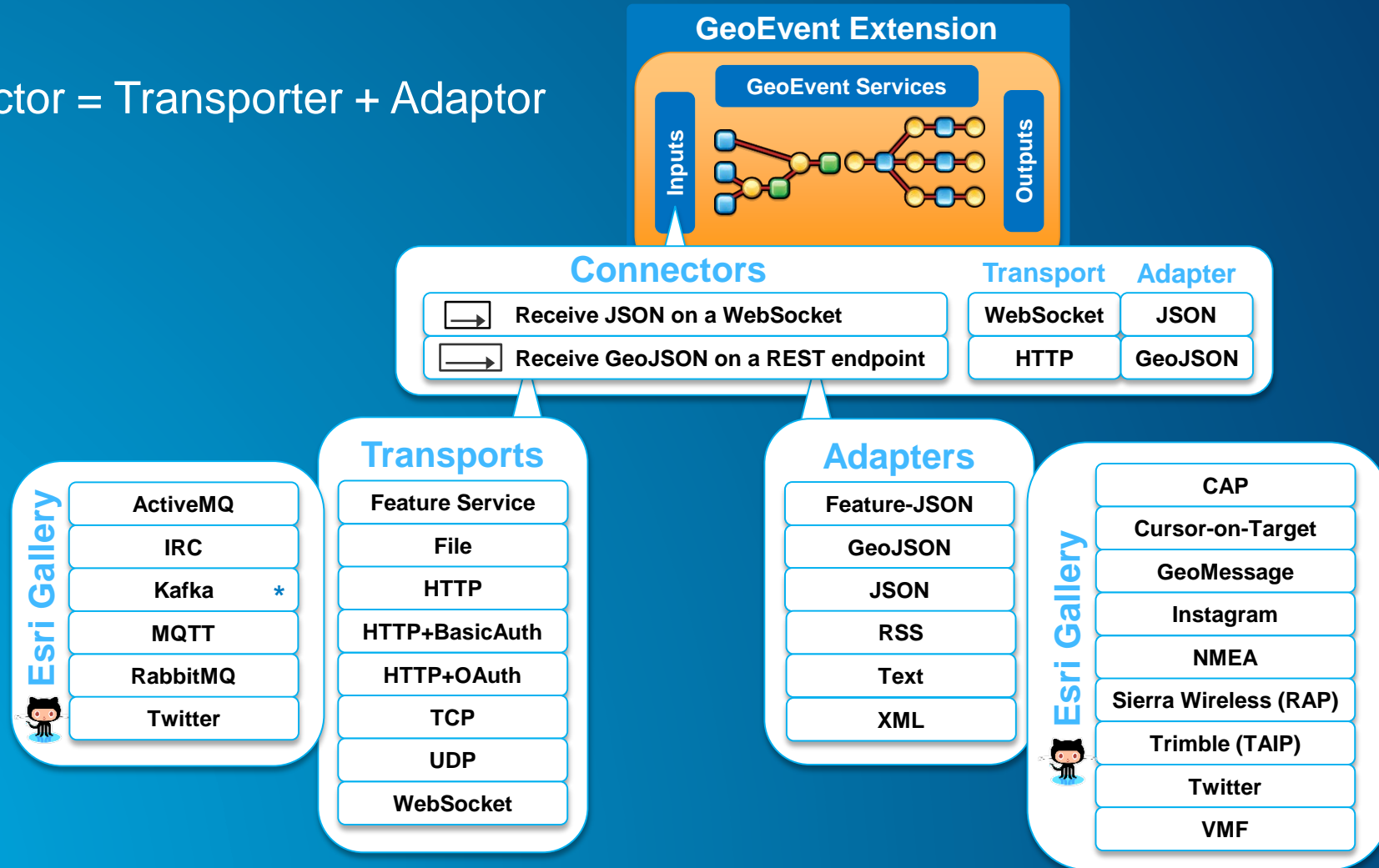
## Partner Gallery

-  CompassCom CompassLDE
-  enviroCar enviroCar
-  exactEarth exactEarth AIS
-  FAA (ASDI) \*
-  GNIP \*
-  Verizon Networkfleet \*
-  osisoft OSisoft \*
-  Valarm
-  ZONAR Zonar \*



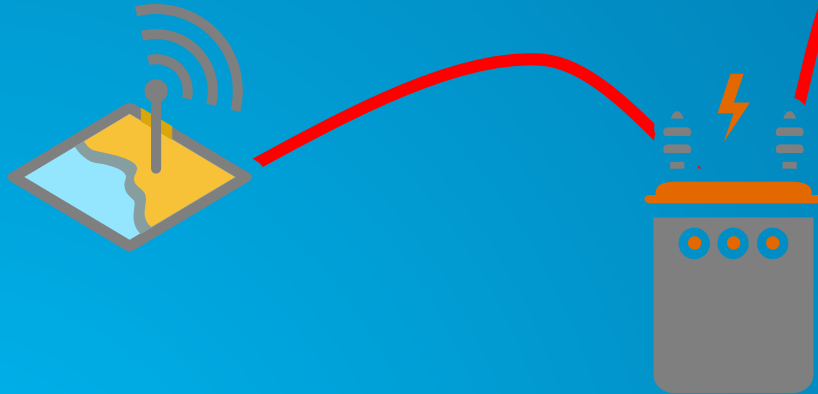
# Receiving Real-Time Data

- Input Connector = Transporter + Adaptor



# GeoEvent Definition

- Schema of your data



GeoEvent Definitions

New GeoEvent Definition Import GeoEvent Definitions

Name	Fields	
Asset	LastUpdated, shape, AssetName, AssetGroupName, Speed, Panic	<a href="#">/</a> <a href="#">x</a> <a href="#">f</a>
Earthquake-MagniDouble	title, link, description, guid, GEOMETRY, geo_lat, geo_long, magn...	<a href="#">/</a> <a href="#">x</a> <a href="#">f</a>
Earthquake-MagniString	title, link, description, guid, GEOMETRY, geo_lat, geo_long, magn...	<a href="#">/</a> <a href="#">x</a> <a href="#">f</a>
EarthquakeOut	title, link, description, guid, GEOMETRY, geo_lat, geo_long, magn...	<a href="#">/</a> <a href="#">x</a> <a href="#">f</a>
FlightGeoEventDefin		
GeoFences		
incident		
Instagram		
openweathermap		
Reuters__World_Ne		
sBahn		
TweetStatus		
TweetWithInfo		
USGS_All_Earthqua		
_Hour		
USGS_All_Earthqua		
_Month		
USGSGeoJSON		

GeoEvent Definition Name: \*

Owner Name: com.esri.ges.adapter.inbound/Flight/10.2.0

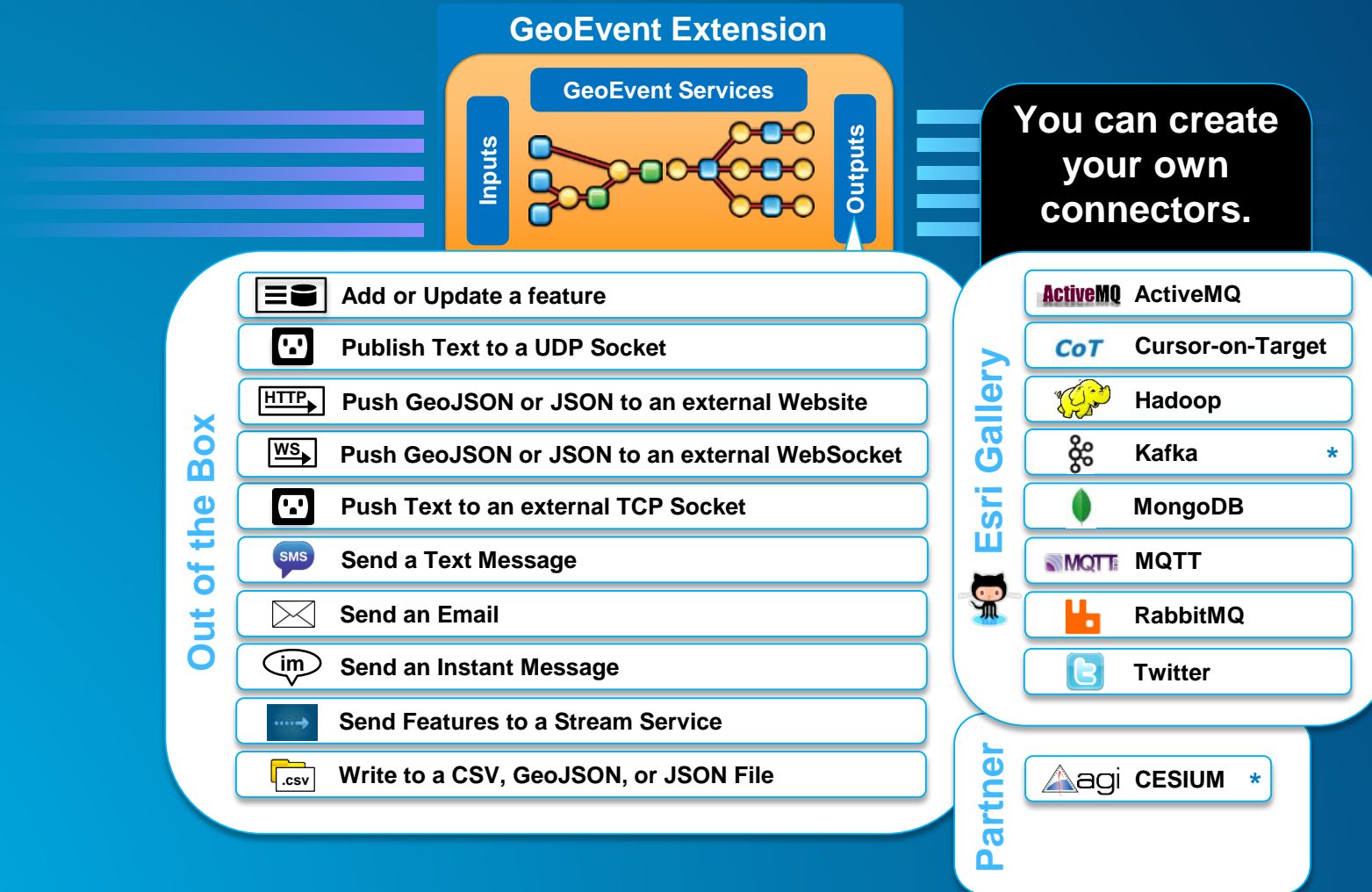
Fields for FlightGeoEventDefinition

New Field Reorder Fields

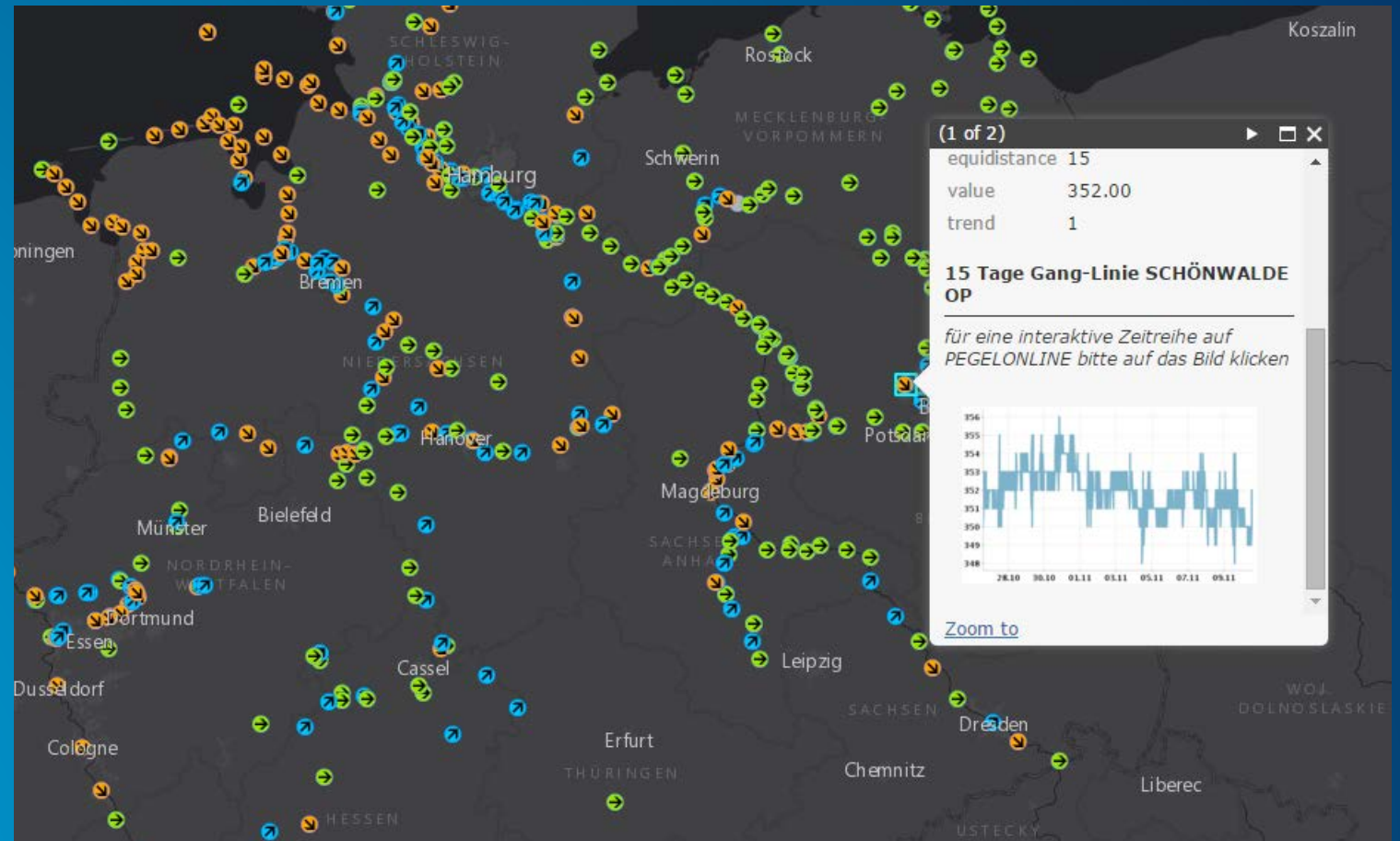
Name	Type	Cardinality	Tags
Name	String	1	
Winkel	Integer	1	
Höhe	Integer	1	
Geschwindigkeit	Integer	1	
Transpondercode	Integer	1	TRACK_ID
Radar	String	1	
Typ	String	1	
Registration	String	1	
Start	String	1	
Ziel	String	1	
Flugnummer	String	1	
Zeitstempel	Date	1	
Shape	Geometry	1	GEOMETRY

# Sending Real-Time Data

*Easily disseminate notifications, alerts, and updates using an Output Connector*



# Demo: Gauges in Germany



- <http://www.arcgis.com/home/item.html?id=7cacac521c824829bbe785ab1a1d2cce>

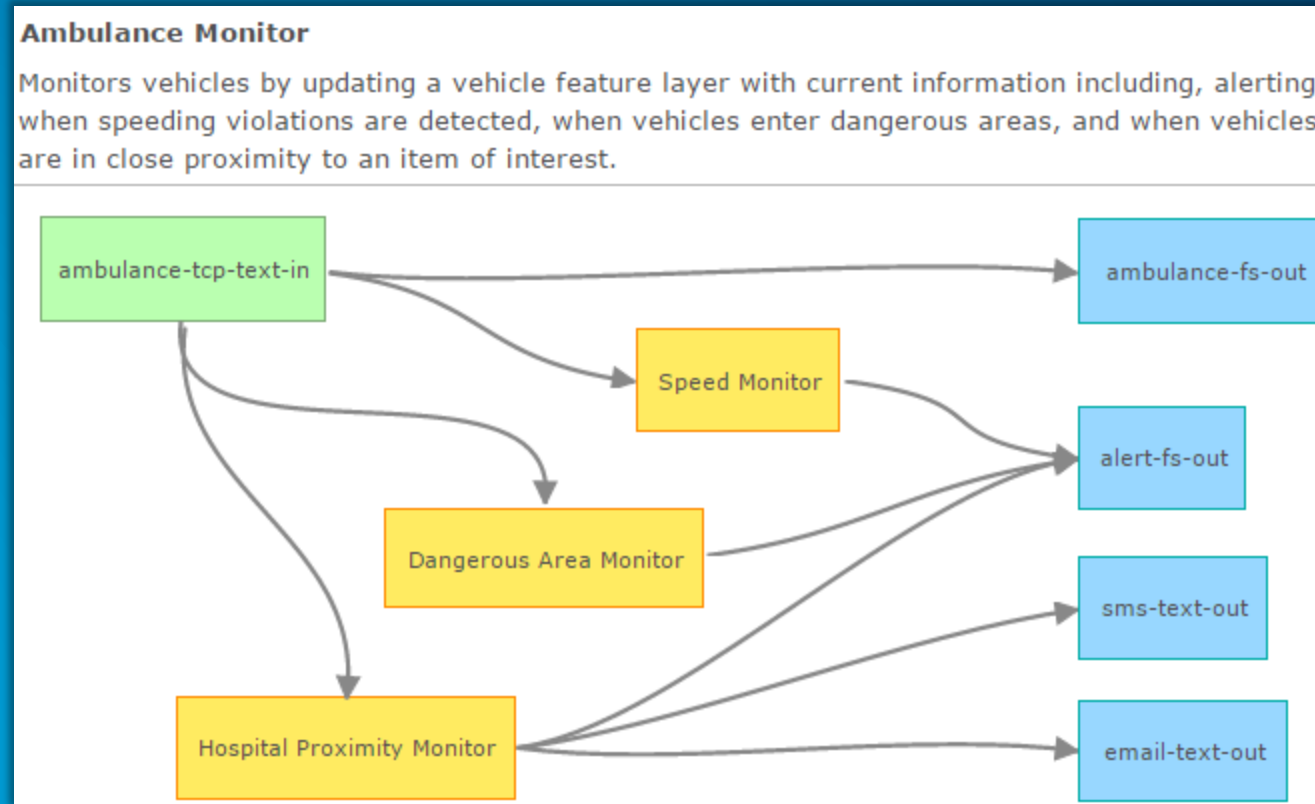


# Applying Real-Time Analytics

# Applying real-time analytics

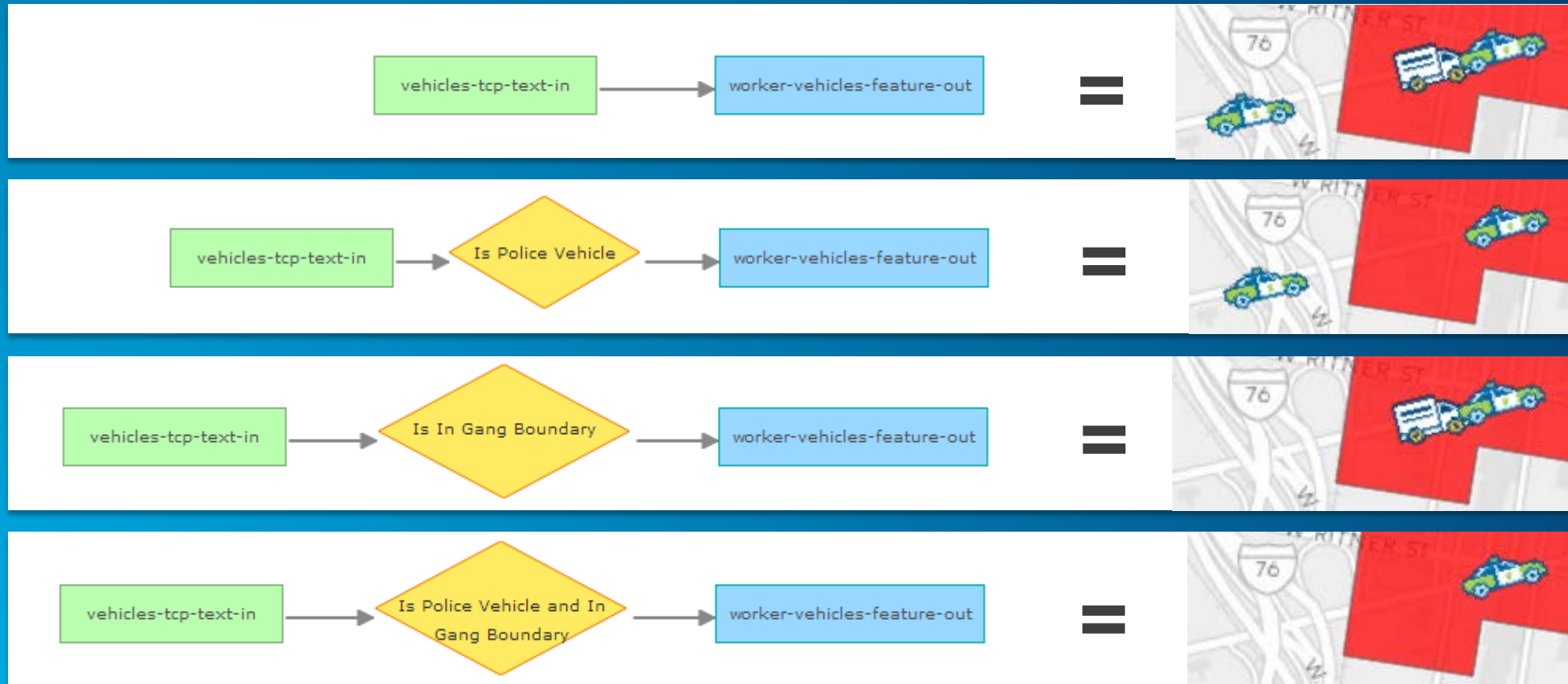
## GeoEvent Services

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



# GeoEvent Filtering

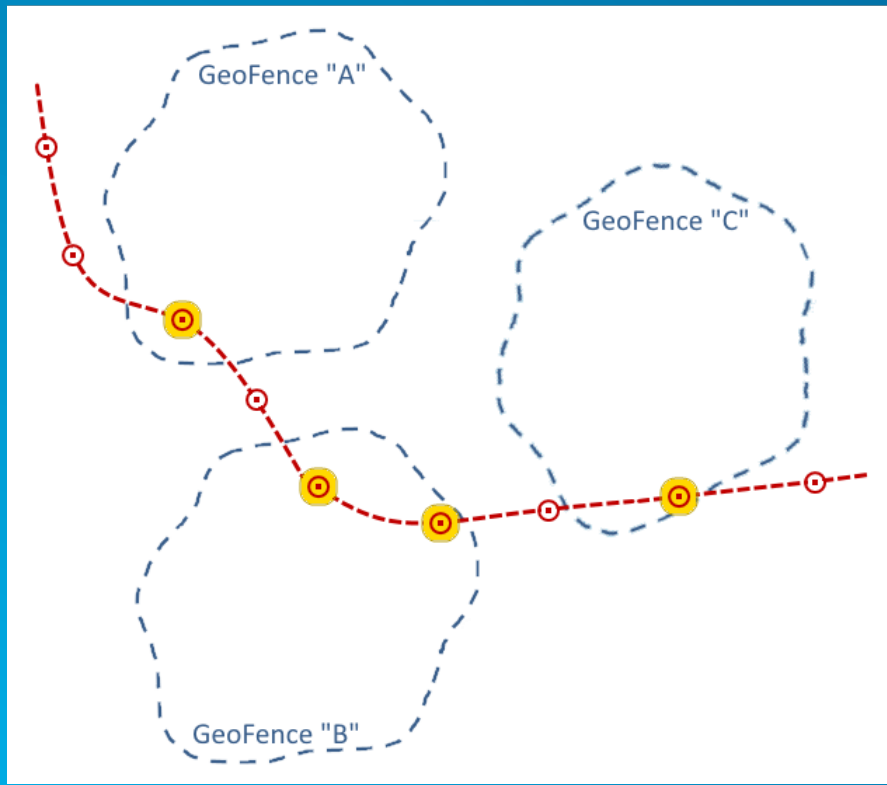
- A **Filter** eliminates GeoEvents based on an Attribute, Spatial, or Combined Expression



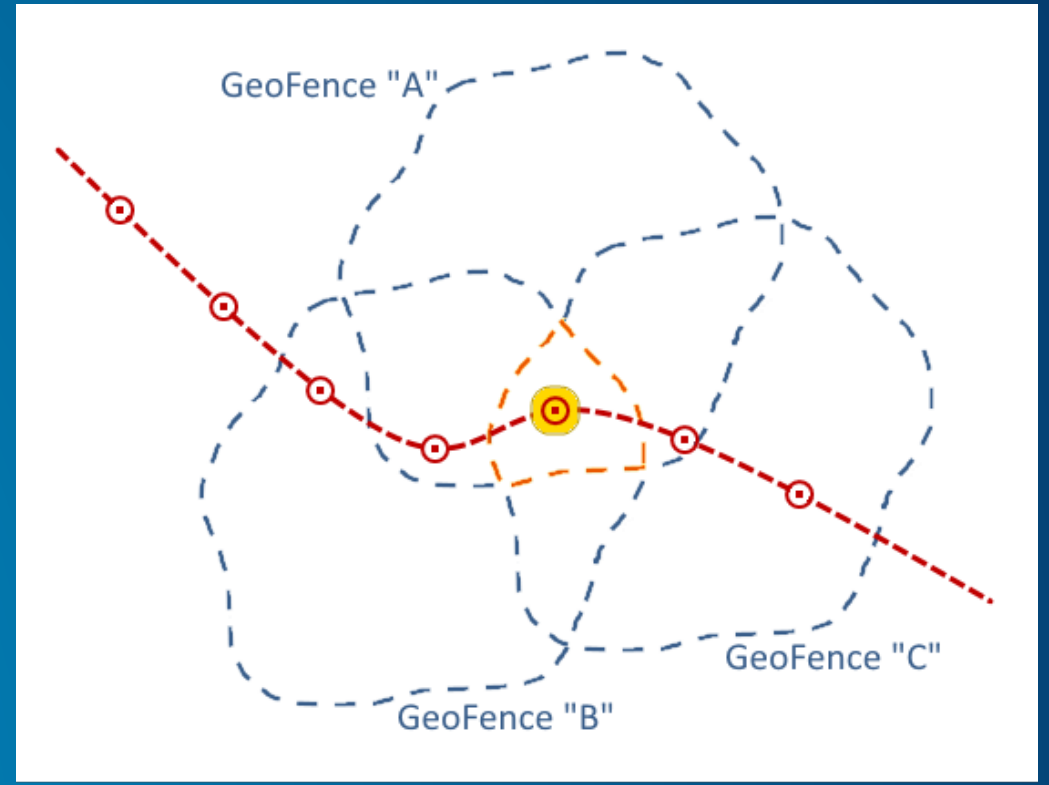
# GeoEvent Filtering

## *GeoFence scope*

- Any GeoFence



- All GeoFences





# GeoEvent Filtering

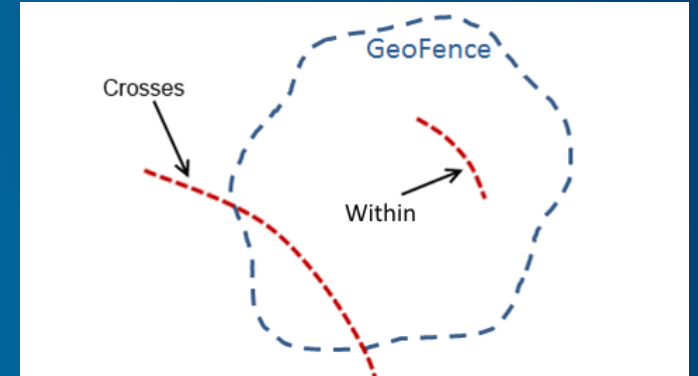
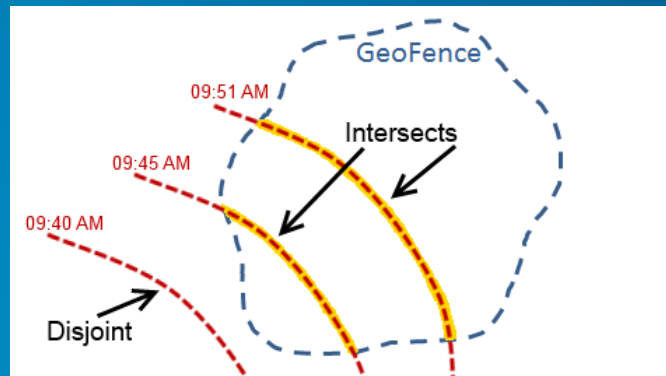
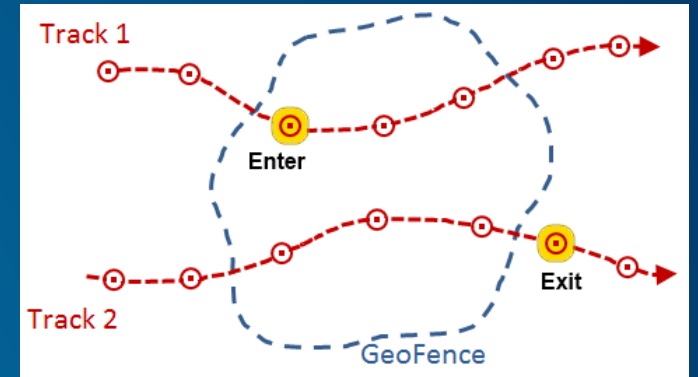
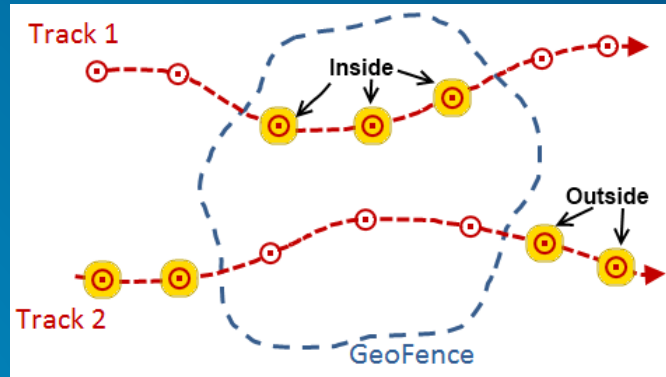
## Spatial filtering

- Spatial operators:

inside	outside
enter	exit

### New at 10.3

intersects	disjoint
touches	contains
crosses	equals
overlaps	within





# GeoEvent Filtering

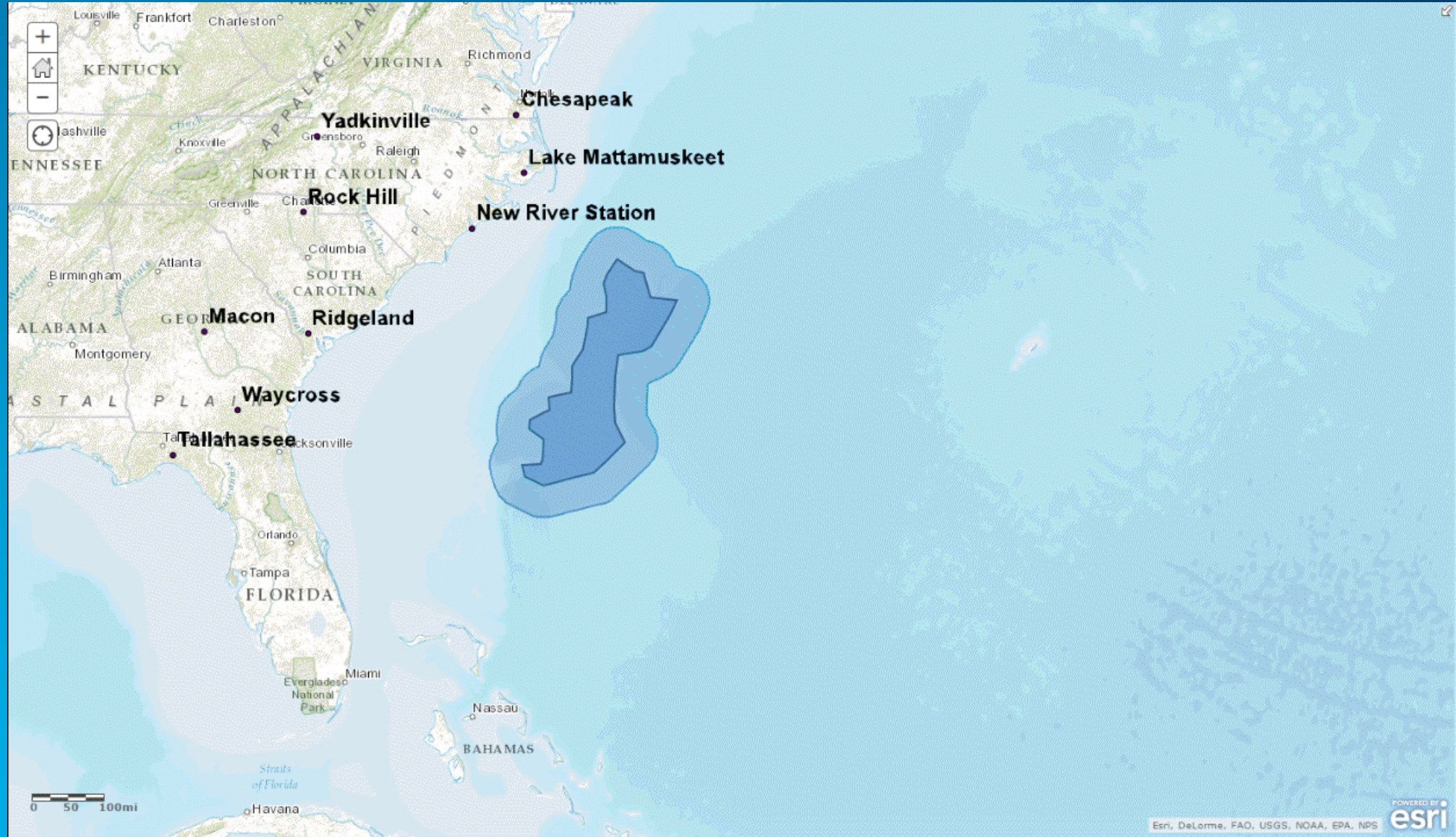
Example – Territory adherence alerting





# GeoEvent Processing

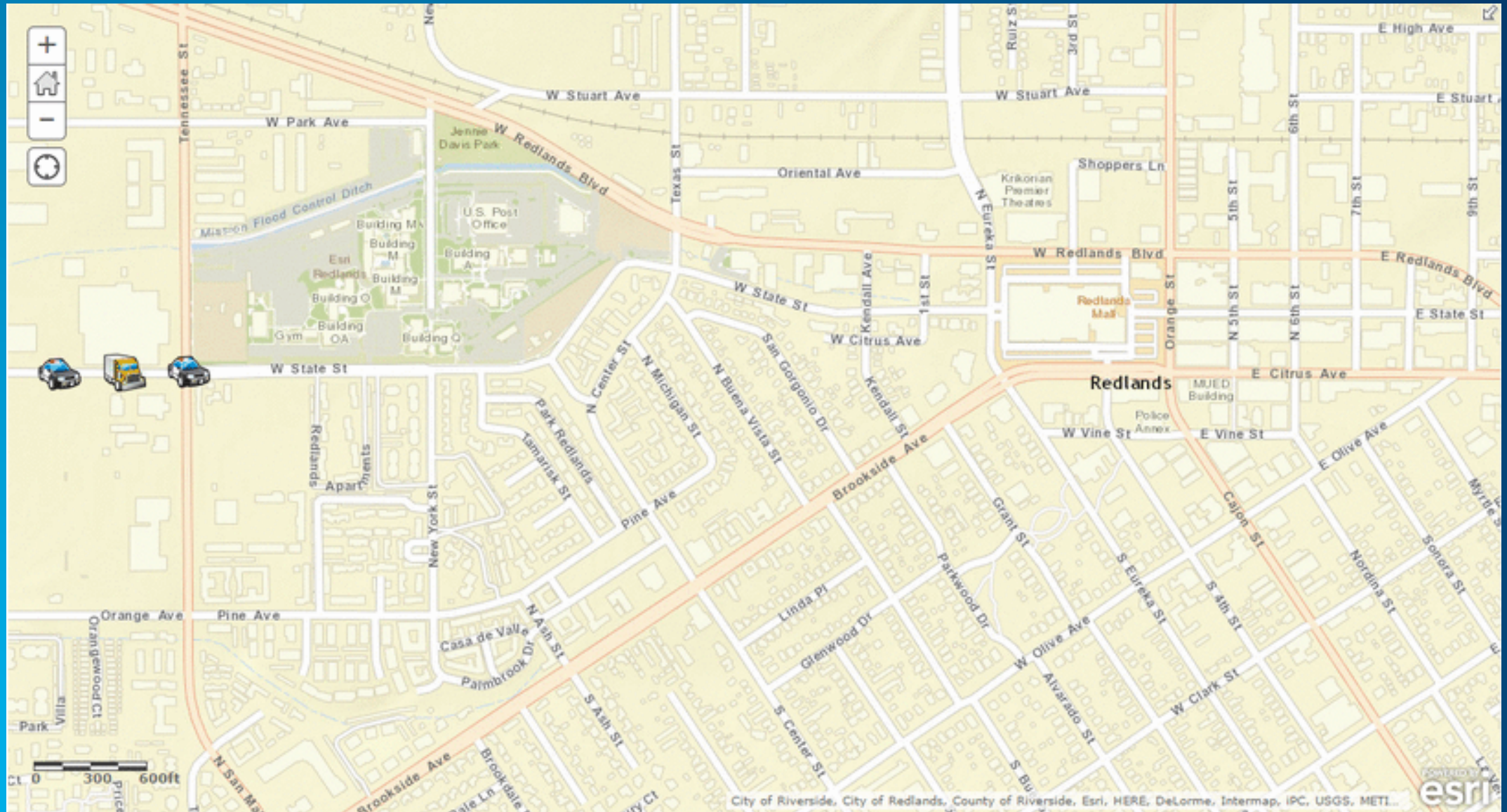
Example – Impending weather notifications





# GeoEvent Processing

Example – Convoy separation alerting

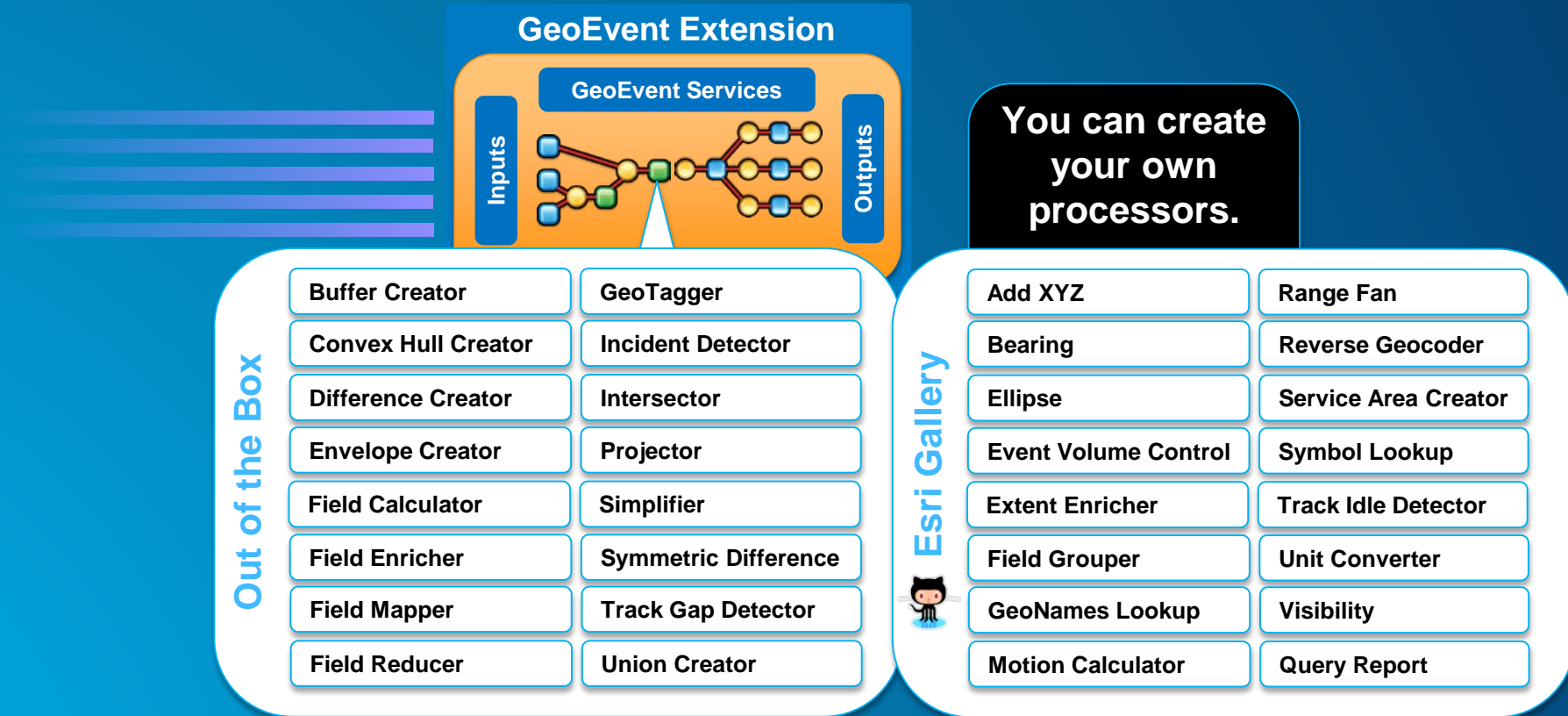




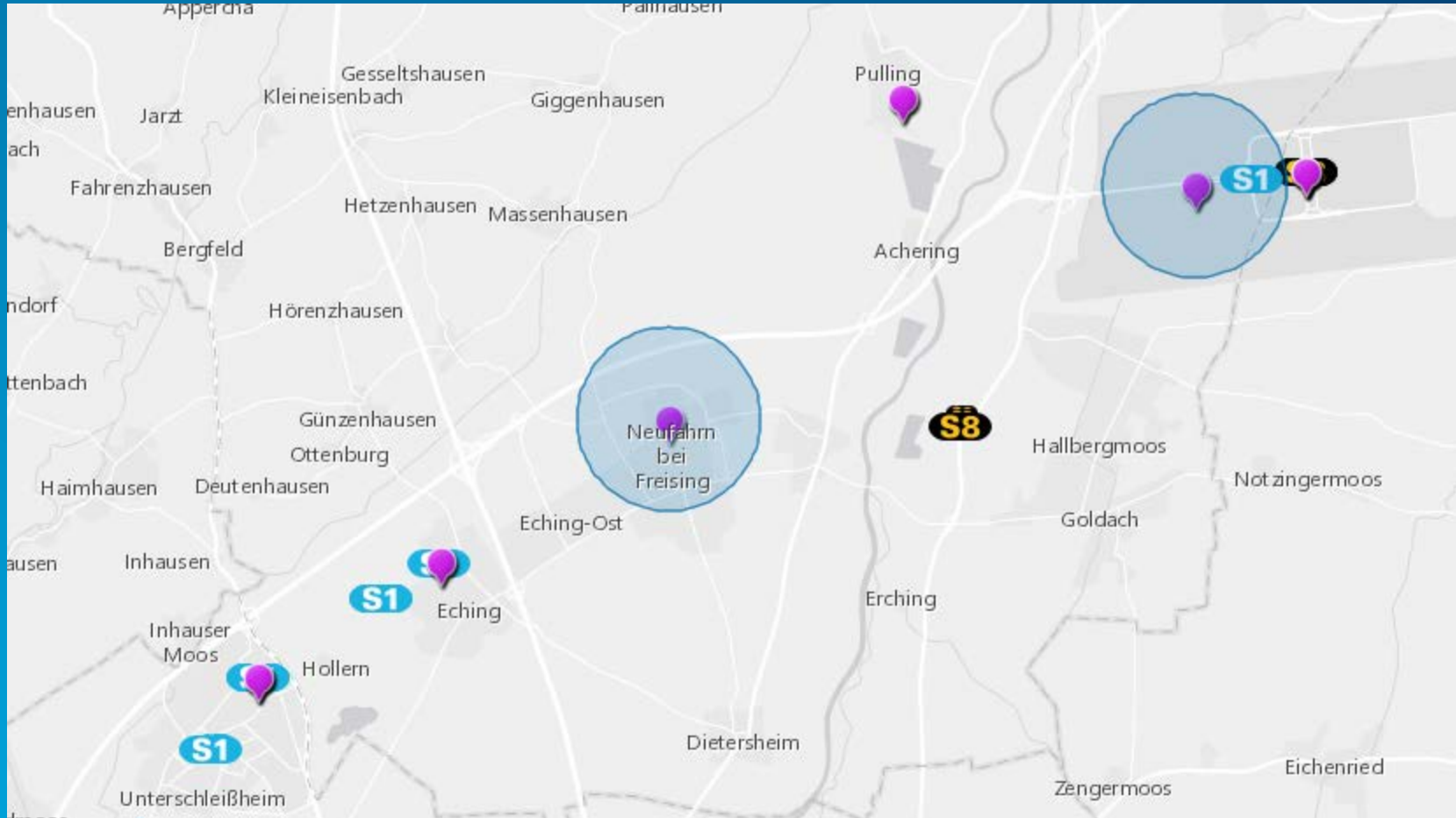
# Applying real-time analytics

## GeoEvent Processing

- You can perform continuous analytics on GeoEvents as they are received using a **processor**.



# Demo: Trains in Munich

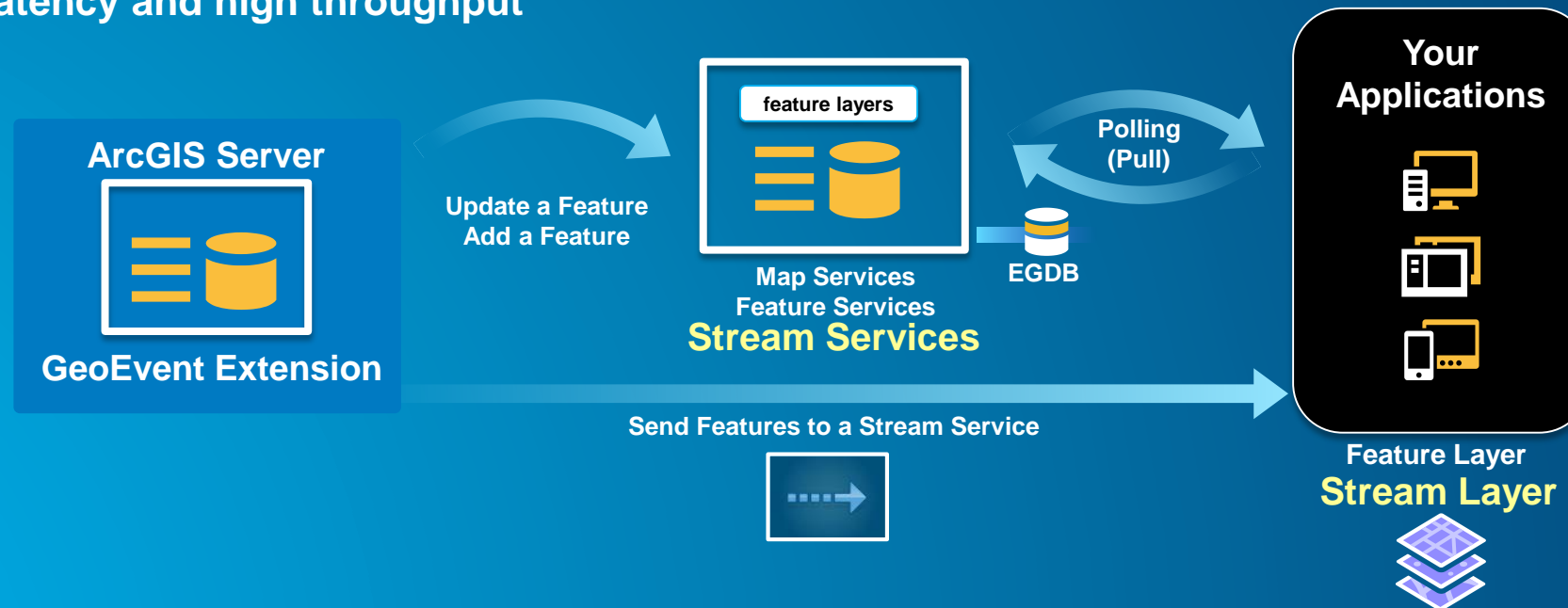


- <http://esride-chb.github.io/DevSummit2015/trainStream.html>

# Getting Real-Time data into Web Apps

*Two patterns*

- Feature layers **pull** from feature services
  - Web apps poll to get periodic updates
  - Must be backed by an enterprise geodatabase (EGDB)
- Stream layers **subscribe** to stream services
  - Web apps subscribe to immediately receive data
  - Low latency and high throughput



# Real-Time GIS



# GeoEvent Extension: An Introduction

## Summary

- **ArcGIS is a dynamic platform that enables continuous analytics and real-time visualization for better understanding of our world.**
- **The ArcGIS GeoEvent Extension for Server allows you to:**
  - know what is happening, as it happens
  - react and make smarter decisions faster
  - be notified when events of interest occur
- **To learn more, visit the 'Get Started' area of the GeoEvent Extension product page:**
  - <http://links.esri.com/geoevent>
- **Ask questions on the GeoEvent Forum:**
  - [https:// links.esri.com/geoevent-forum](https://links.esri.com/geoevent-forum)





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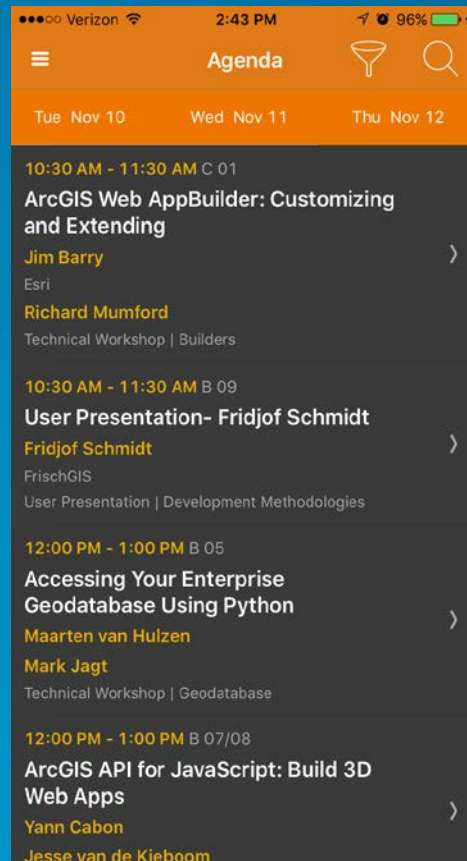
con•terra

# Please Take Our Survey!

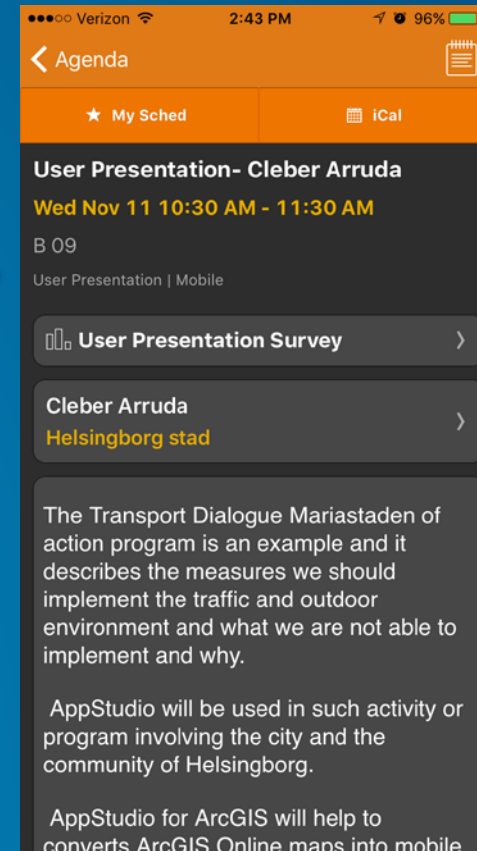
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and find your event



Select the session you  
attended



Select  
"User Presentation Survey"  
or  
"Technical Workshop Survey"



Complete Answers  
and Select "Submit"

