



Real-Time GIS: GeoEvent Extension

Greg Tieman
gtieman@esri.com

RJ Sunderman
rsunderman@esri.com

The background is a solid blue color. On the left side, there is a decorative graphic consisting of several overlapping geometric shapes in shades of purple, teal, and yellow. One of the yellow shapes contains a faint, grid-like map pattern, possibly representing a geographic area. The text "What is Real-Time GIS?" is centered in the upper half of the image in a white, bold, sans-serif font.

What is Real-Time GIS?

GIS Data

What has happened, what is happening, what will happen



Credit: iStockphoto/chris_lemmens

*The **'current'** snapshot is outdated almost as soon as it's created...*

Real-Time GIS Data

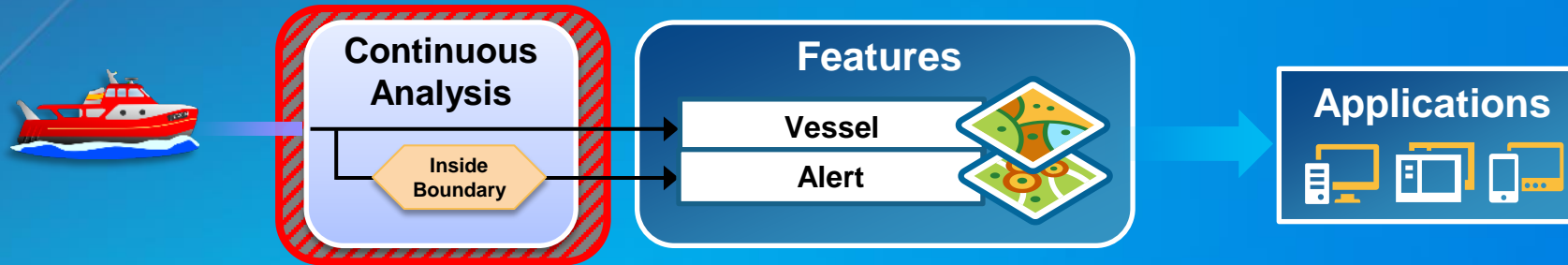
Continuous stream of events flowing from a sensor or feed



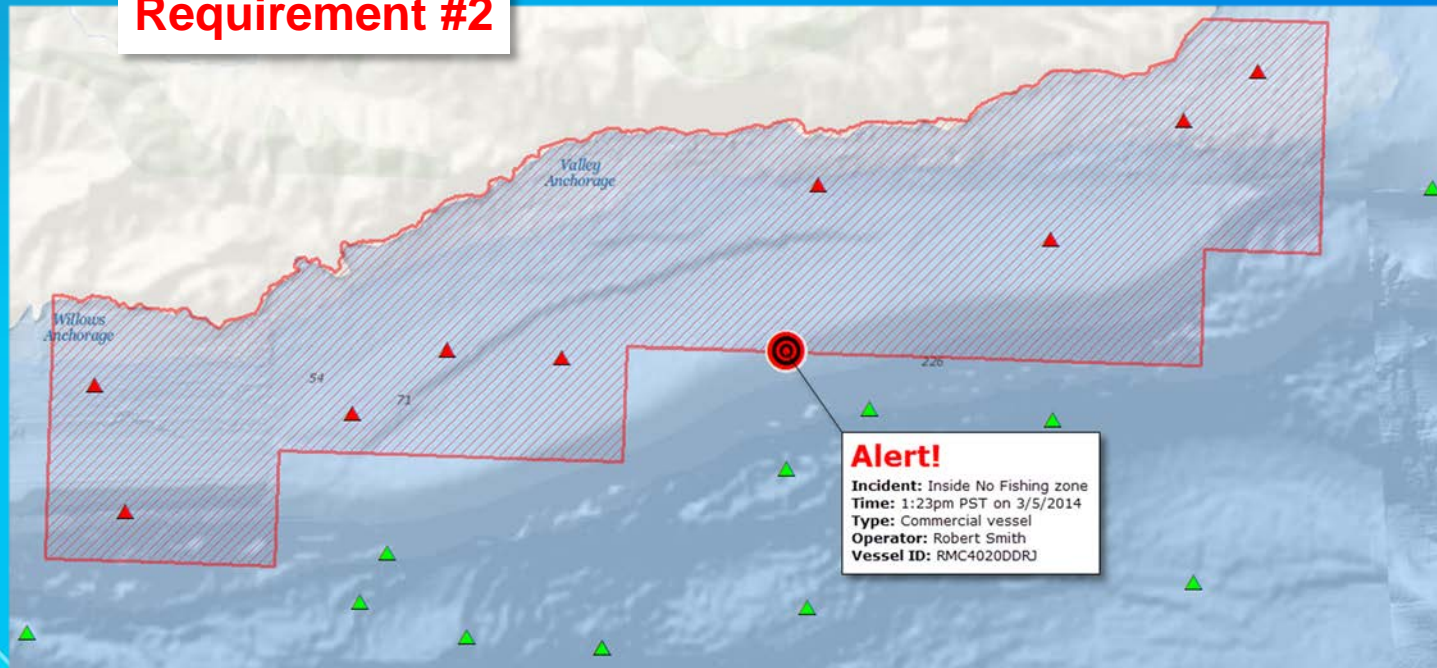
Each event represents the latest state of the sensor...

Real-Time Analytics

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

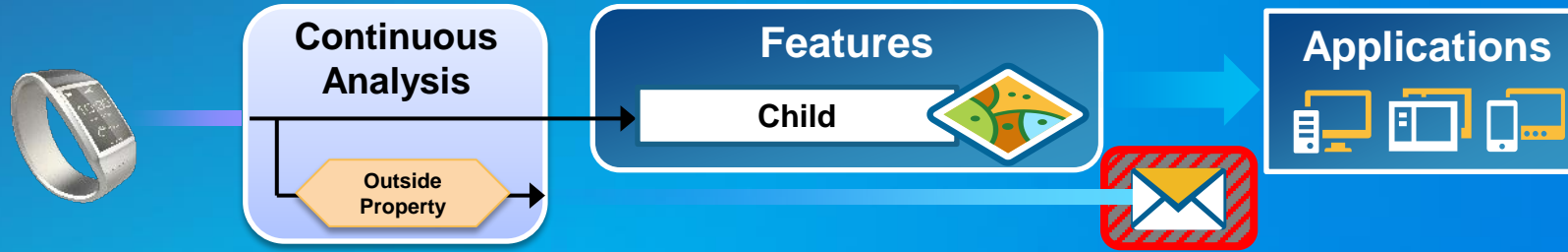


Requirement #2



Real-Time Notifications and Alerting

Notify a parent when their child leaves school property



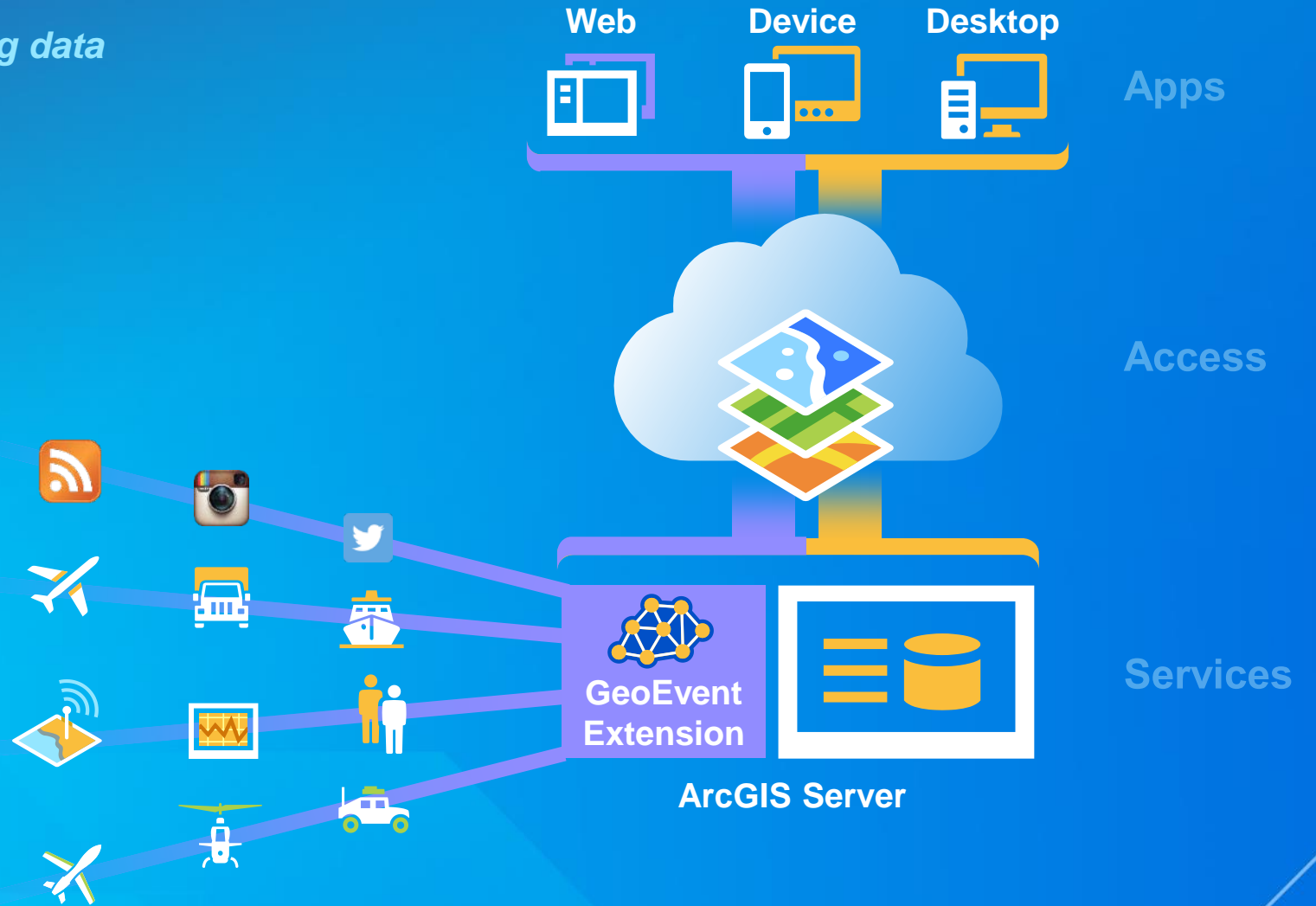
Requirement #3

A map of a school area with a red dashed boundary around "Latonia Elementary School". A red target icon is placed above the school. A red-bordered envelope icon with "SMS" written on it is positioned between the school and a smartphone. The smartphone screen shows an iMessage alert: "ALERT! Your child has left school property. Click [here](#) to show their current location." The map shows streets including NE 42ND ST, NE 41ST ST, NE 40TH ST, NE 39TH ST, NE 38TH ST, NE 37TH ST, NE 36TH ST, NE 35TH ST, NE 34TH ST, NE 33RD ST, NE 32ND ST, NE 31ST ST, NE 30TH ST, NE 29TH ST, NE 28TH ST, NE 27TH ST, NE 26TH ST, NE 25TH ST, NE 24TH ST, NE 23RD ST, NE 22ND ST, NE 21ST ST, NE 20TH ST, NE 19TH ST, NE 18TH ST, NE 17TH ST, NE 16TH ST, NE 15TH ST, NE 14TH ST, NE 13TH ST, NE 12TH ST, NE 11TH ST, NE 10TH ST, NE 9TH ST, NE 8TH ST, NE 7TH ST, NE 6TH ST, NE 5TH ST, NE 4TH ST, NE 3RD ST, NE 2ND ST, NE 1ST ST, NE CAMPUS PKWY, NE LINCOLN WAY, NE COWLITZ RD, NE ADAMS LN, NE UNIVERSITY BLVD, BURKE GILMAN TRL, NORTHLAKE FL, NORTHLAKE WY, and ADAMS LN NE.

Real-Time GIS

Integration & 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



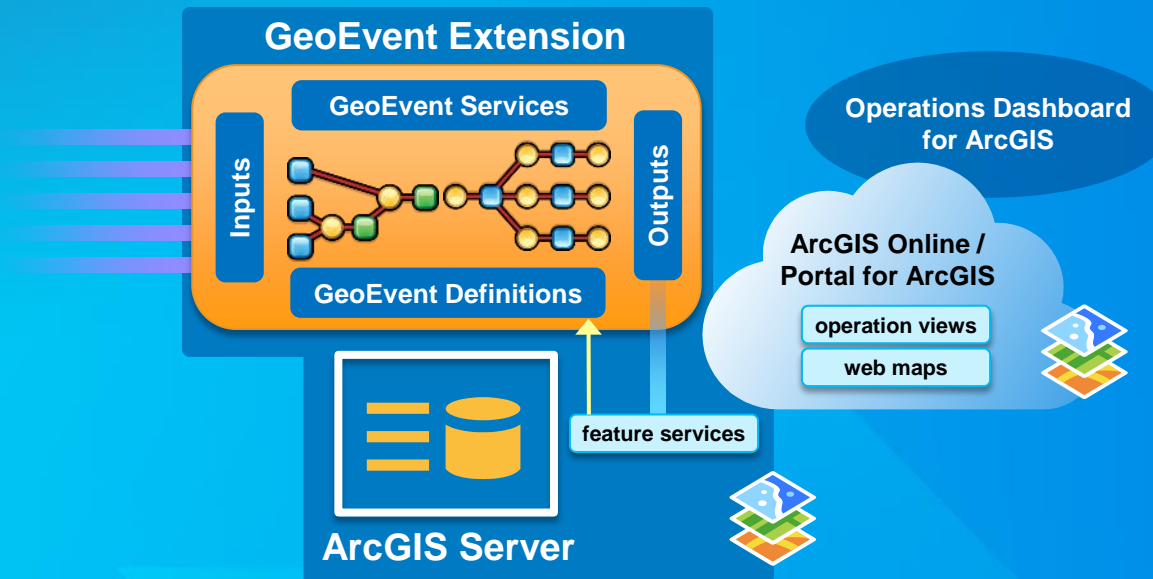
The background features a vibrant blue gradient. On the left side, there are several overlapping geometric shapes: a large purple triangle pointing upwards, a yellow triangle pointing downwards, and a purple triangle pointing to the right. These shapes are layered, creating a sense of depth. The text is positioned in the upper right quadrant of the image.

Working with Real-Time Data

Working with Real-Time Data

Making features come alive

- Connect an **output** to your feature
- Import the schema of your feature as a **GeoEvent Definition**
- Configure an **input** to receive real-time data
- Author and publish a **GeoEvent Service**
- Visualize your real-time feature



Making Features Come Alive

Worker Safety

Worker Safety * Publish Back

Status	In/Out	Count	Rate (over last 5 mins)	Max Rate	Time Since Last	Action
STARTED	In	1,770	3 /sec	3 /sec	00:00:00	
	Out	184	0 /sec	1 /sec	00:00:00	

Layout

New Elements


Filter Processor

Inputs

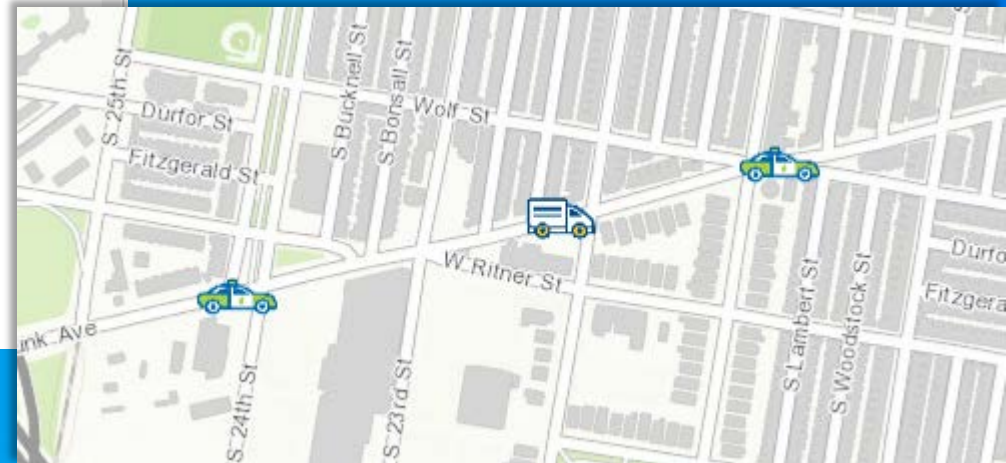
- vehicle-tcp-text-in

Outputs

- vehicle-fs-out



```
graph LR; A[vehicle-tcp-text-in] --> B[vehicle-fs-out]
```



Receiving Real-Time Data









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

GeoEvent Extension















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
-  esd
-  GeoMessage
-  Instagram
-  KML
-  Kafka *
-  NMEA 0183
-  RabbitMQ *
-  Sierra Wireless (RAP)
-  Trimble (TAIP)
-  Twitter

Partner Gallery

-  CompassLDE
-  enviroCar
-  exactEarth AIS
-  FAA (ASDI) *
-  GNIP *
-  Networkfleet *
-  OSisoft *
-  Valarm
-  Zonar *

Sending Real-Time Data











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

GeoEvent Extension











You can create your own connectors.

Out of the Box

-  Add or Update a feature
-  Publish Text to a UDP Socket
-  Push GeoJSON or JSON to an external Website
-  Push GeoJSON or JSON to an external WebSocket
-  Push Text to an external TCP Socket
-  Send a Text Message
-  Send an Email
-  Send an Instant Message
-  Send Features to a Stream Service
-  Write to a CSV, GeoJSON, or JSON File

Esri Gallery

-  ActiveMQ
-  Cursor-on-Target
-  Hadoop
-  Kafka *
-  MongoDB
-  MQTT
-  RabbitMQ
-  Twitter

Partner

-  Agi CESIUM *

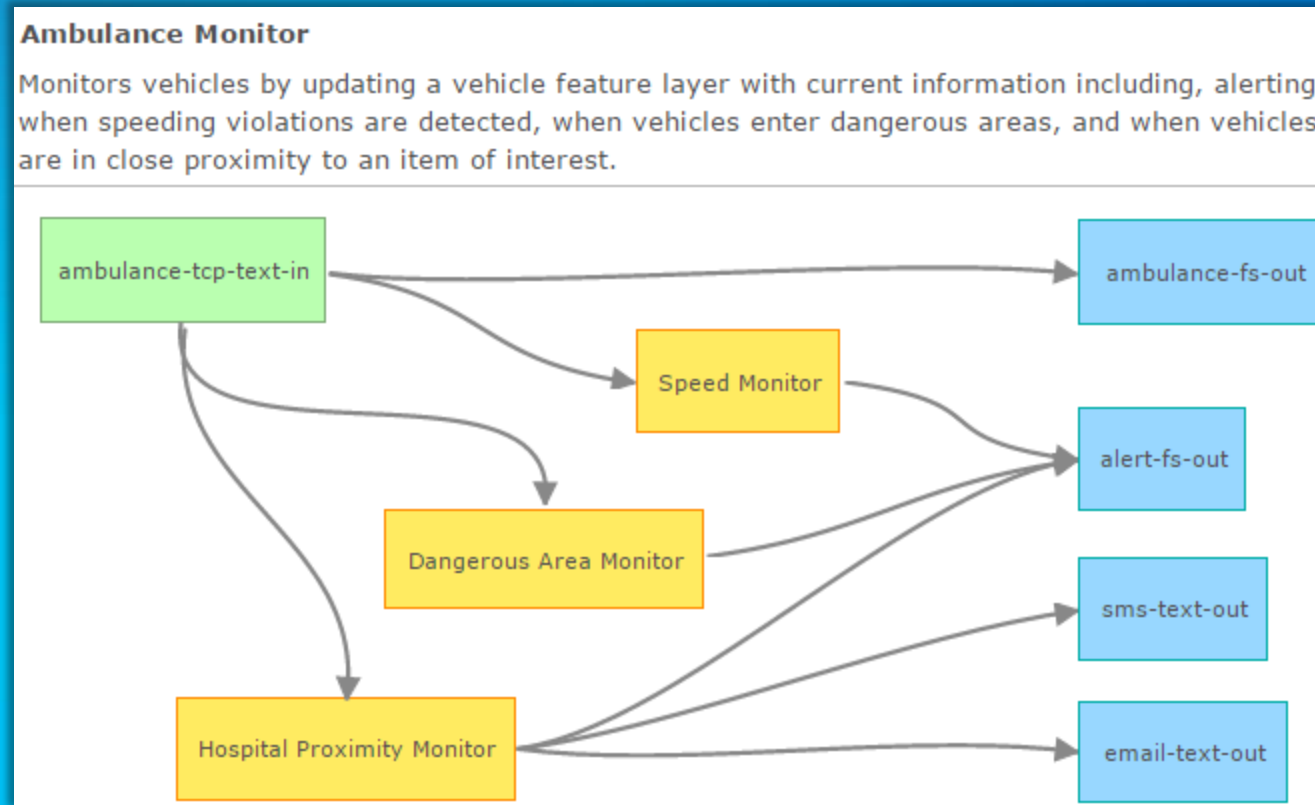
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Applying Real-Time Analytics

Applying real-time analytics

GeoEvent Services

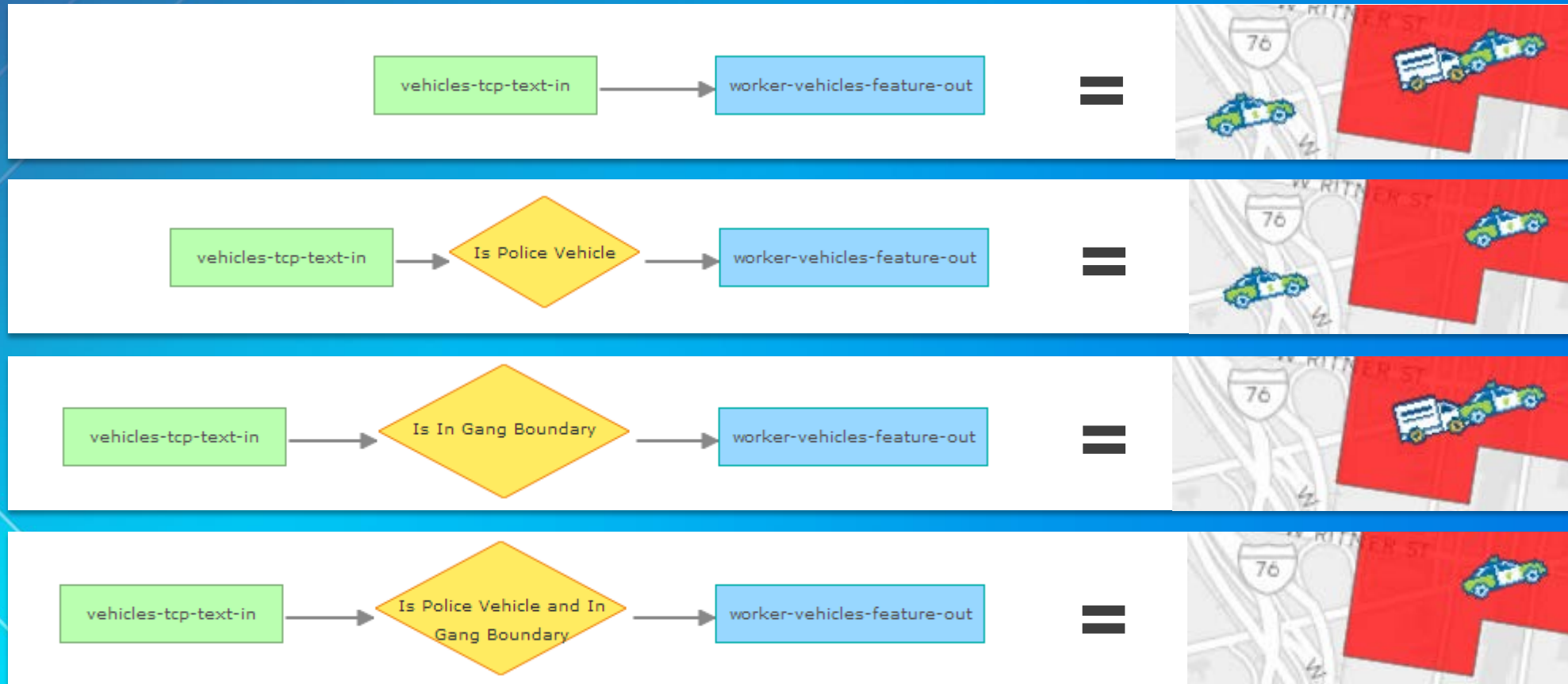
- A **GeoEvent Service** defines the flow of GeoEvents,
 - The **Filtering** and **Processing** steps to perform
 - what input(s) to apply them to
 - and what output(s) to send the results to



Applying real-time analytics

GeoEvent Filtering

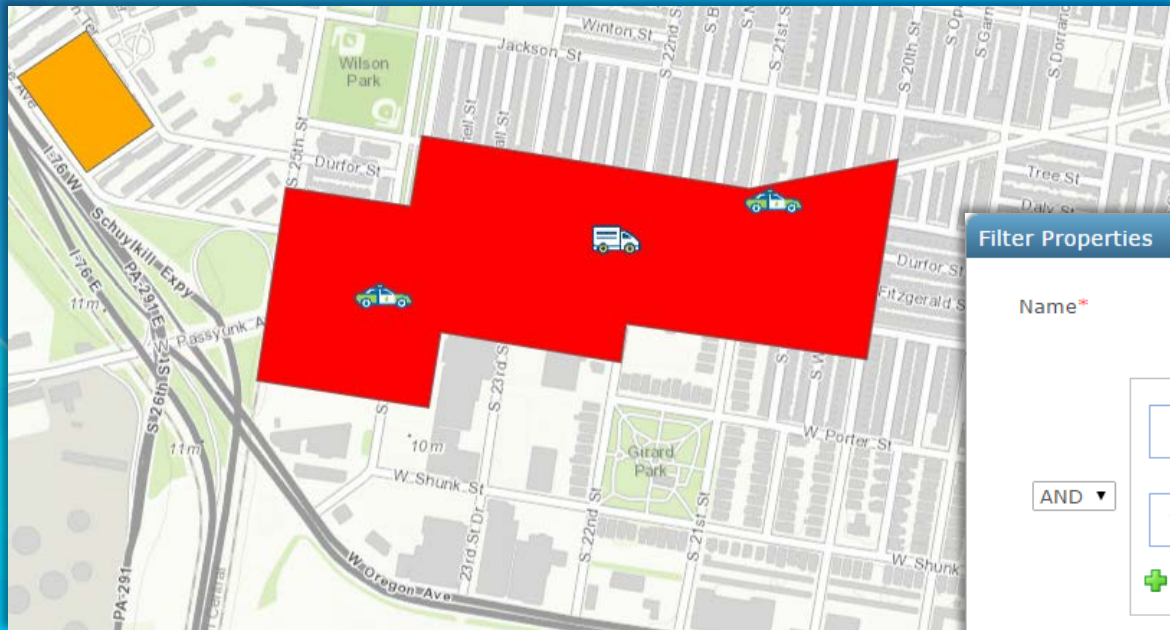
- A **Filter** eliminates GeoEvents based on an expression.



Demo

GeoEvent Filtering

Attribute, Spatial, and Combined Expressions



Filter Properties

Name*

GEOMETRY **INSIDE ANY** GangBoundary-Hot/. *

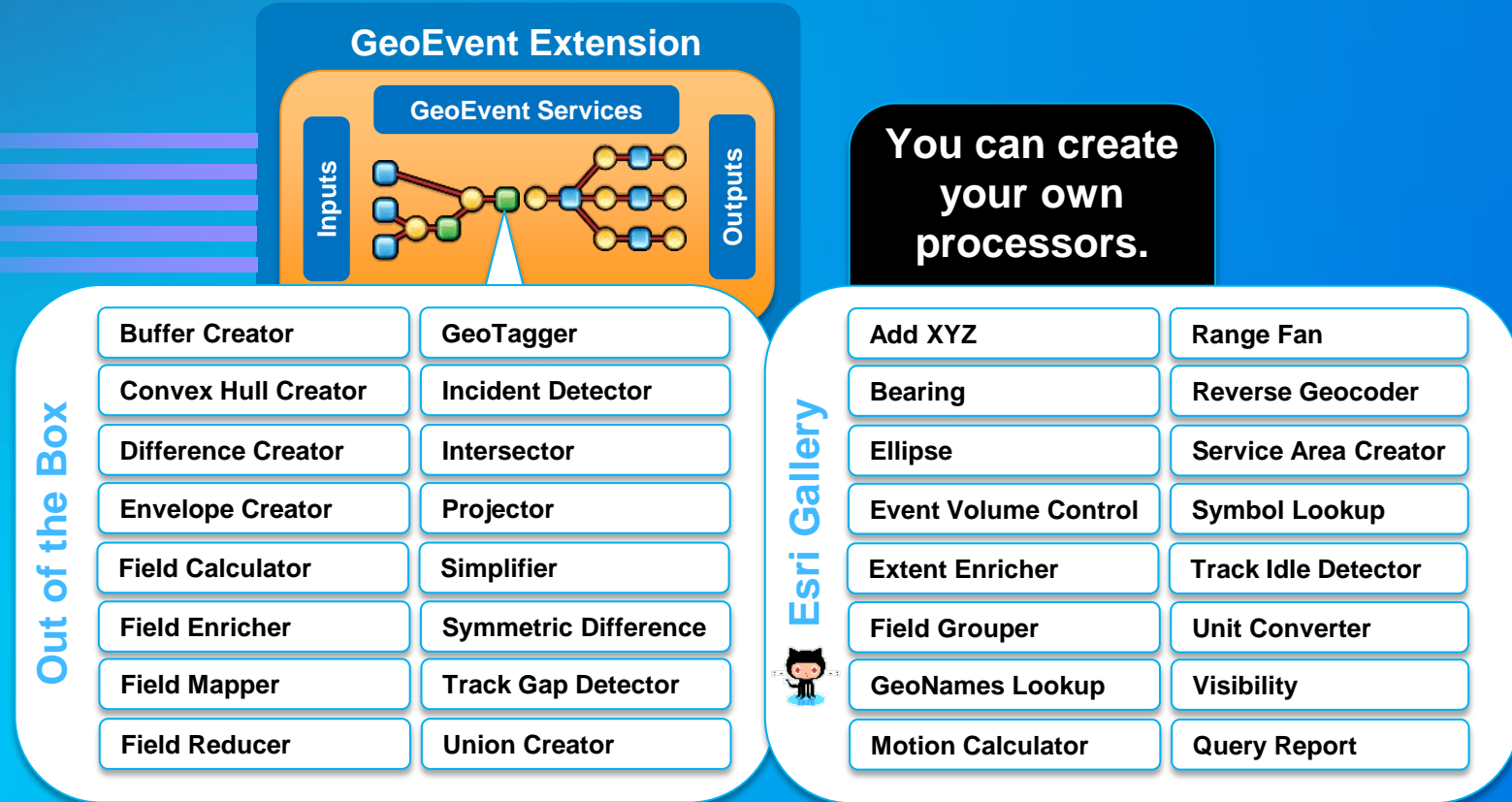
AND ▼

VehicleType = Truck

Applying Real-Time Analytics

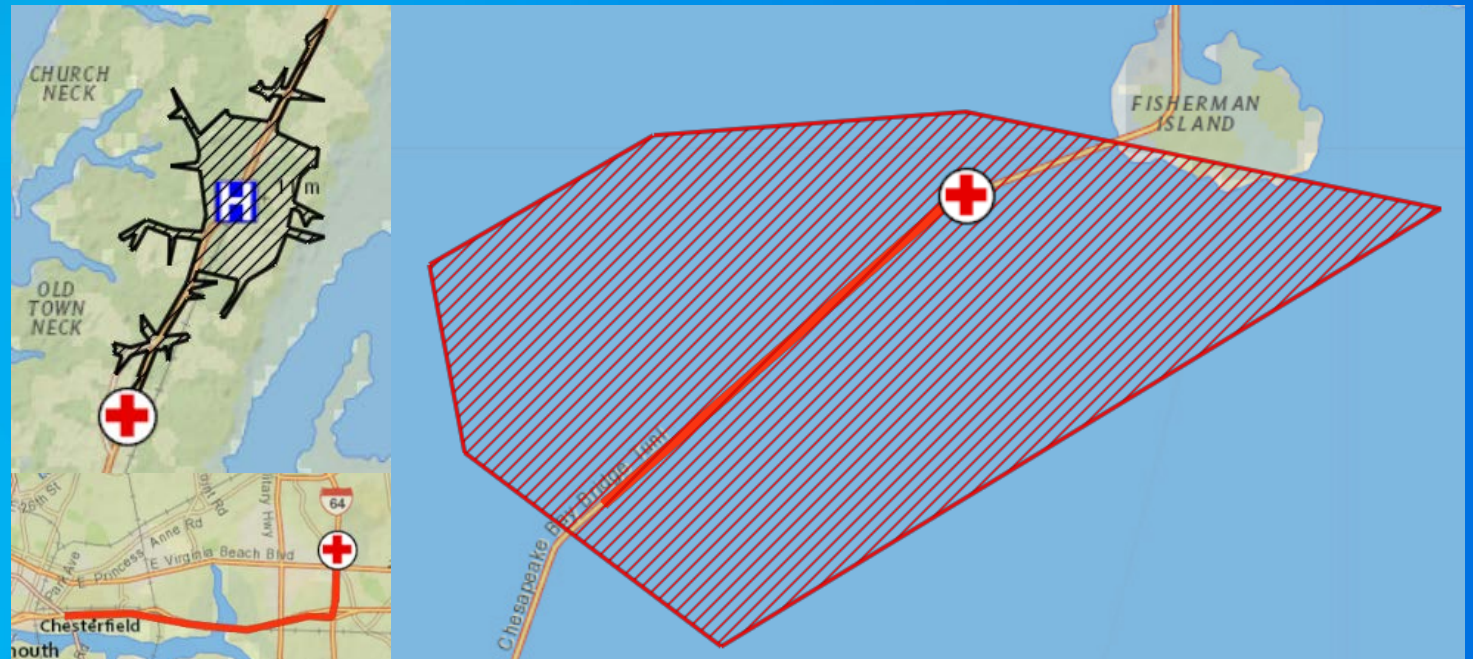
GeoEvent Processing


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



GeoEvent Processing

Incident Detection



 **AMB-15** is inside a Dangerous area Ongoing for last 7 minutes and 0 seconds.

Additional Real-Time Spatial Analytics

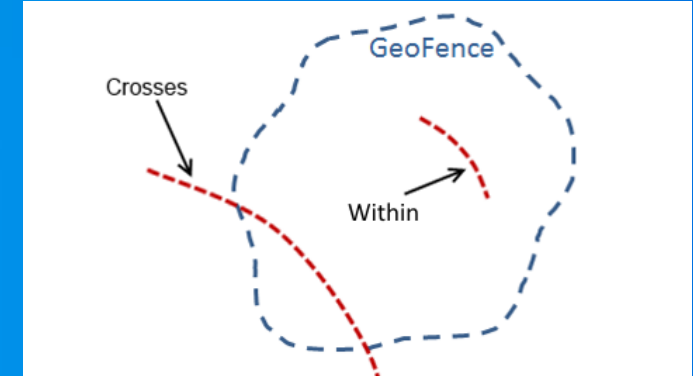
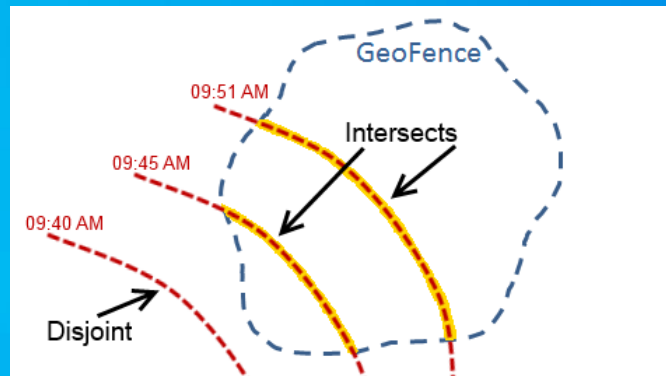
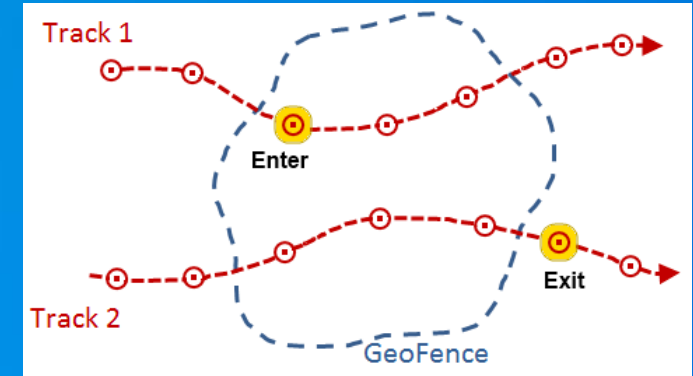
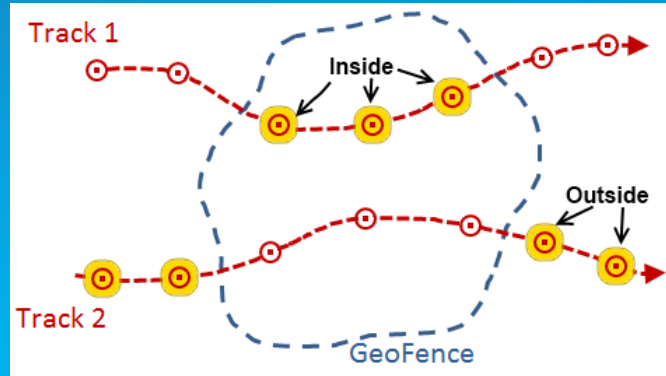
Spatial filtering

- Spatial operators:

inside	outside
enter	exit

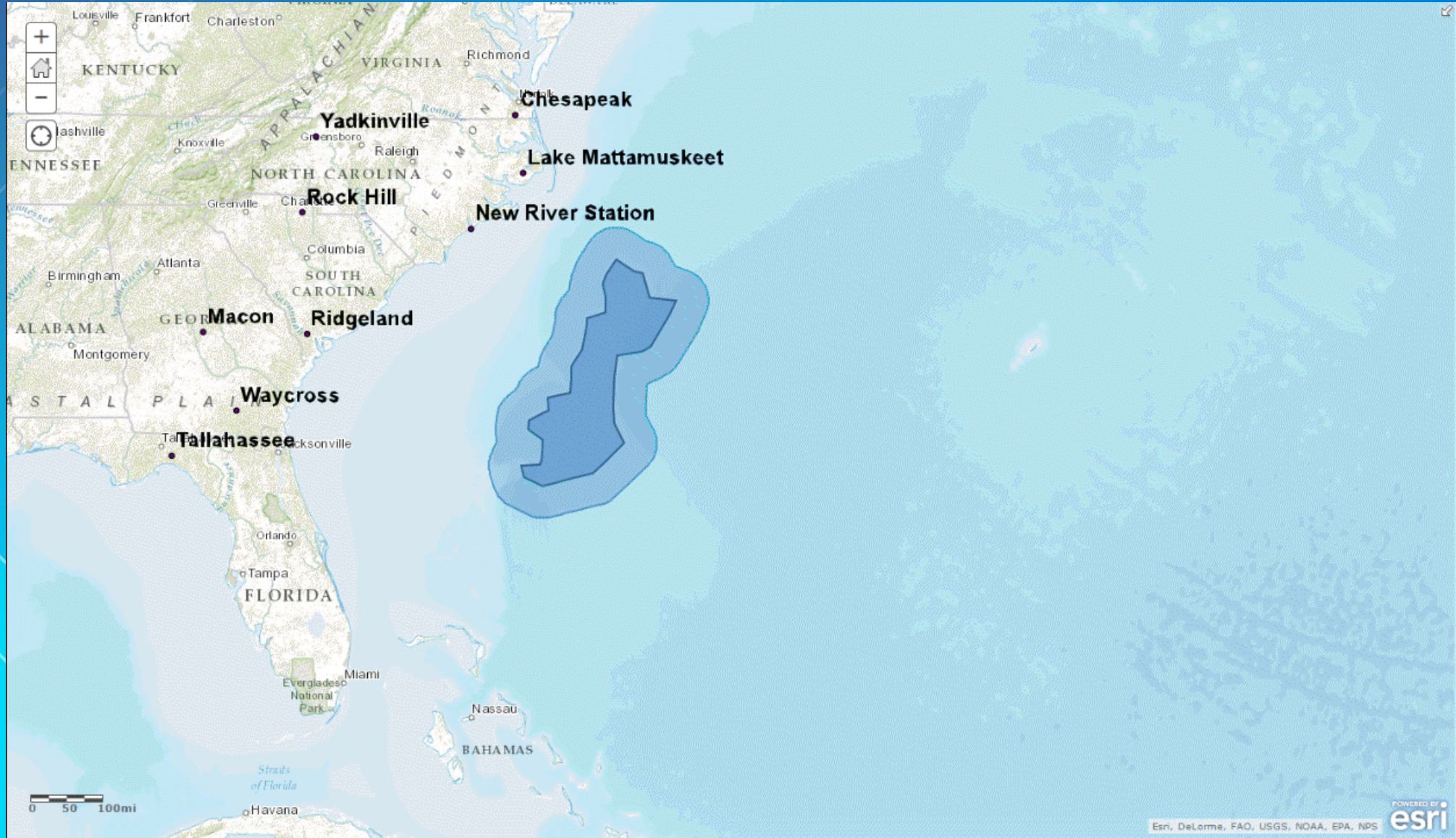
New at 10.3

intersects	disjoint
touches	contains
crosses	equals
overlaps	within



Additional Real-Time Spatial Analytics

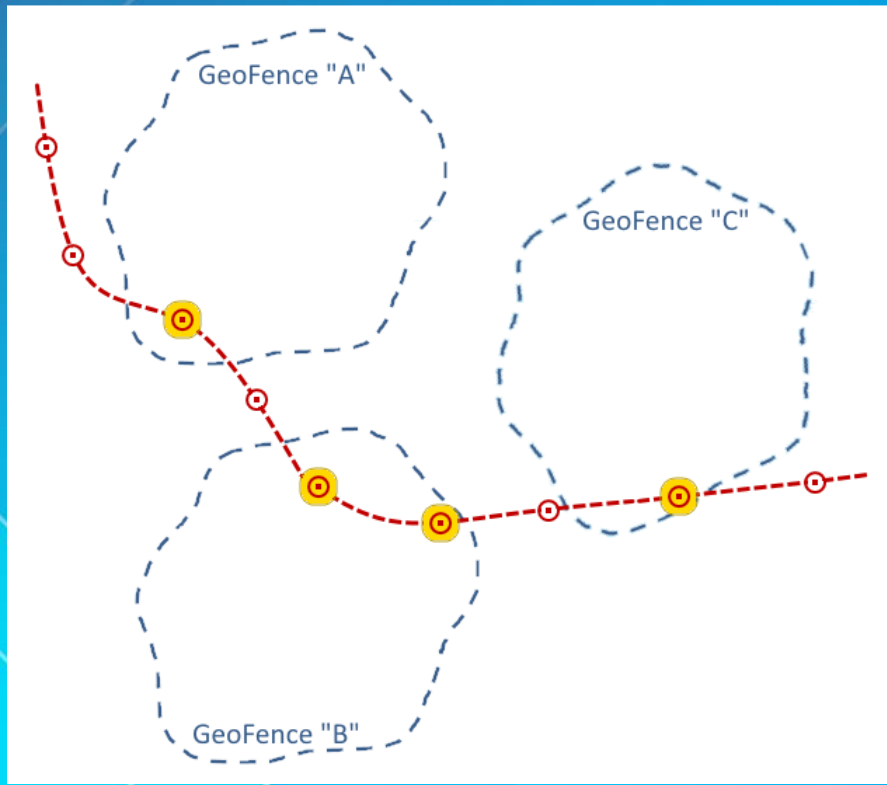
Example – Impending weather notifications



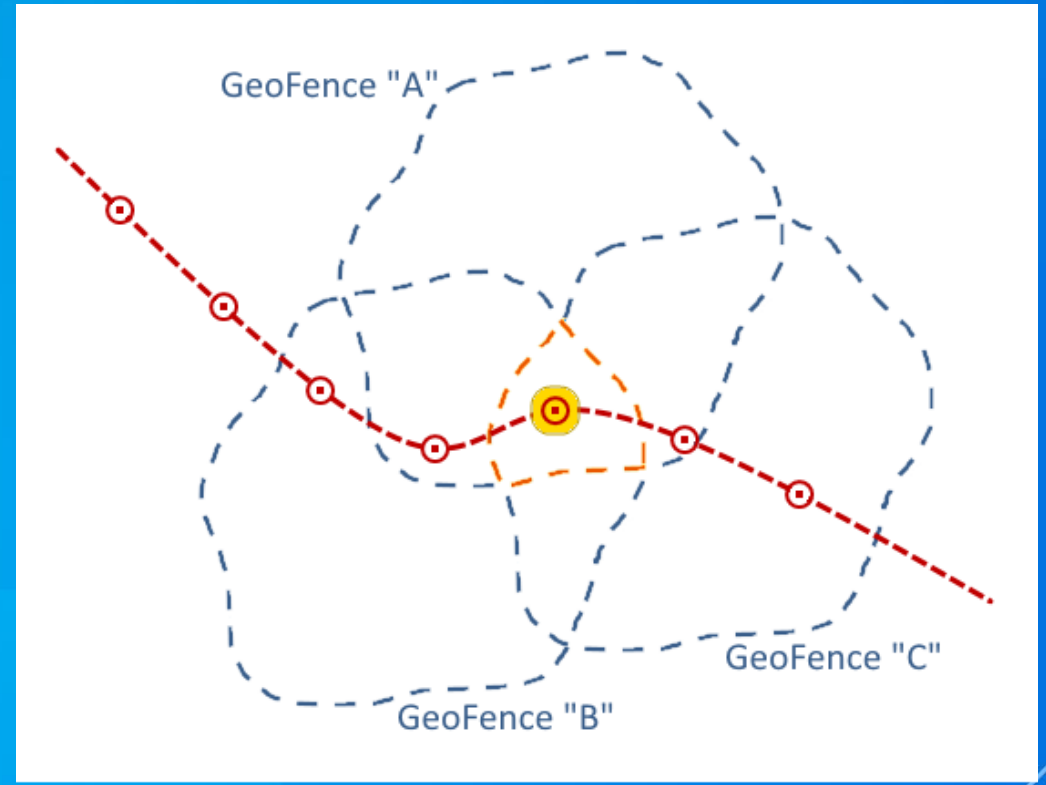
Additional Real-Time Spatial Analytics

GeoFence scope

- Specify a GeoFence scope: Any or All
- Any GeoFence



- All GeoFences



Additional Real-Time Spatial Analytics

Example – Territory adherence alerting

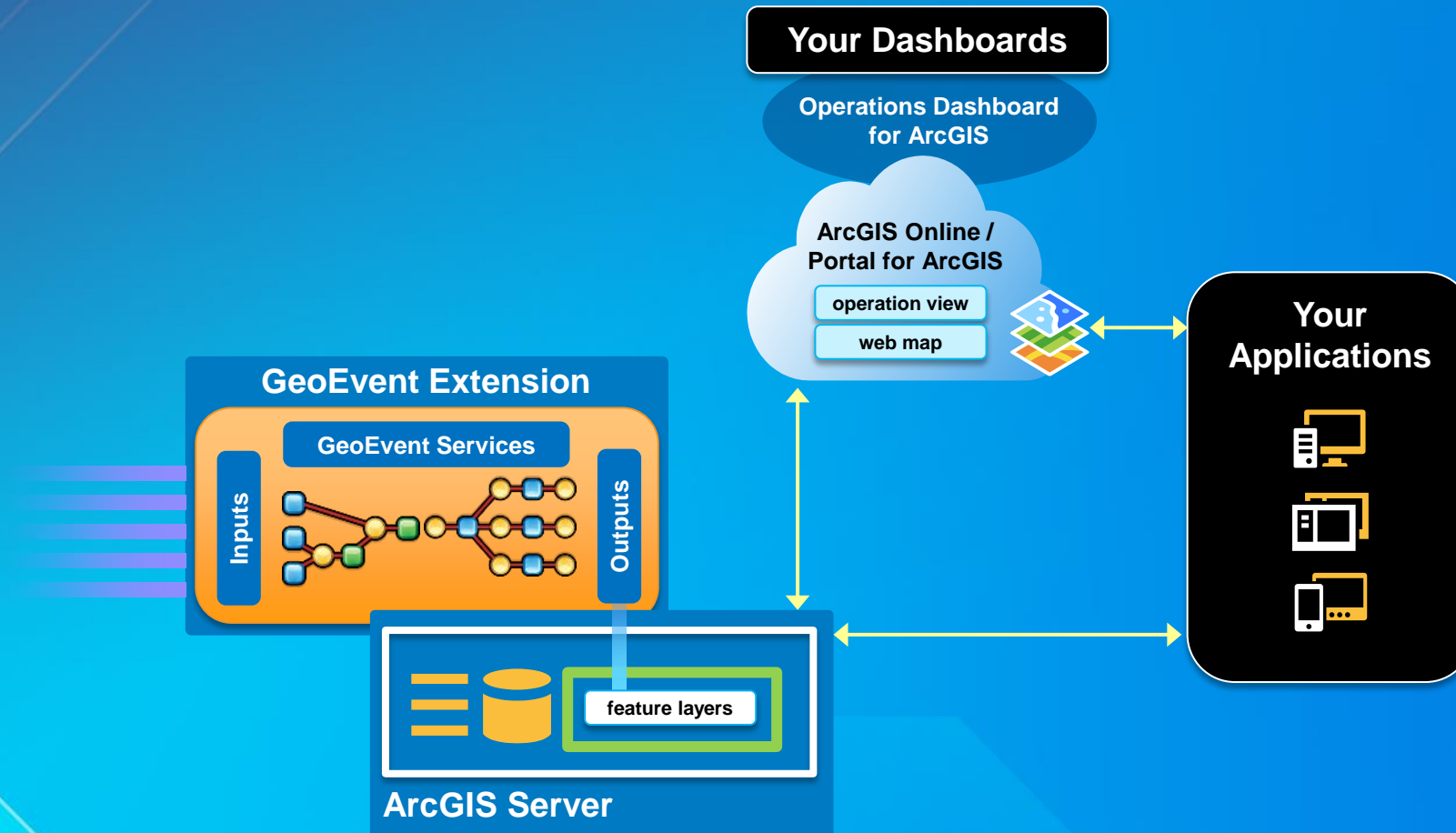




RESTful Discovery

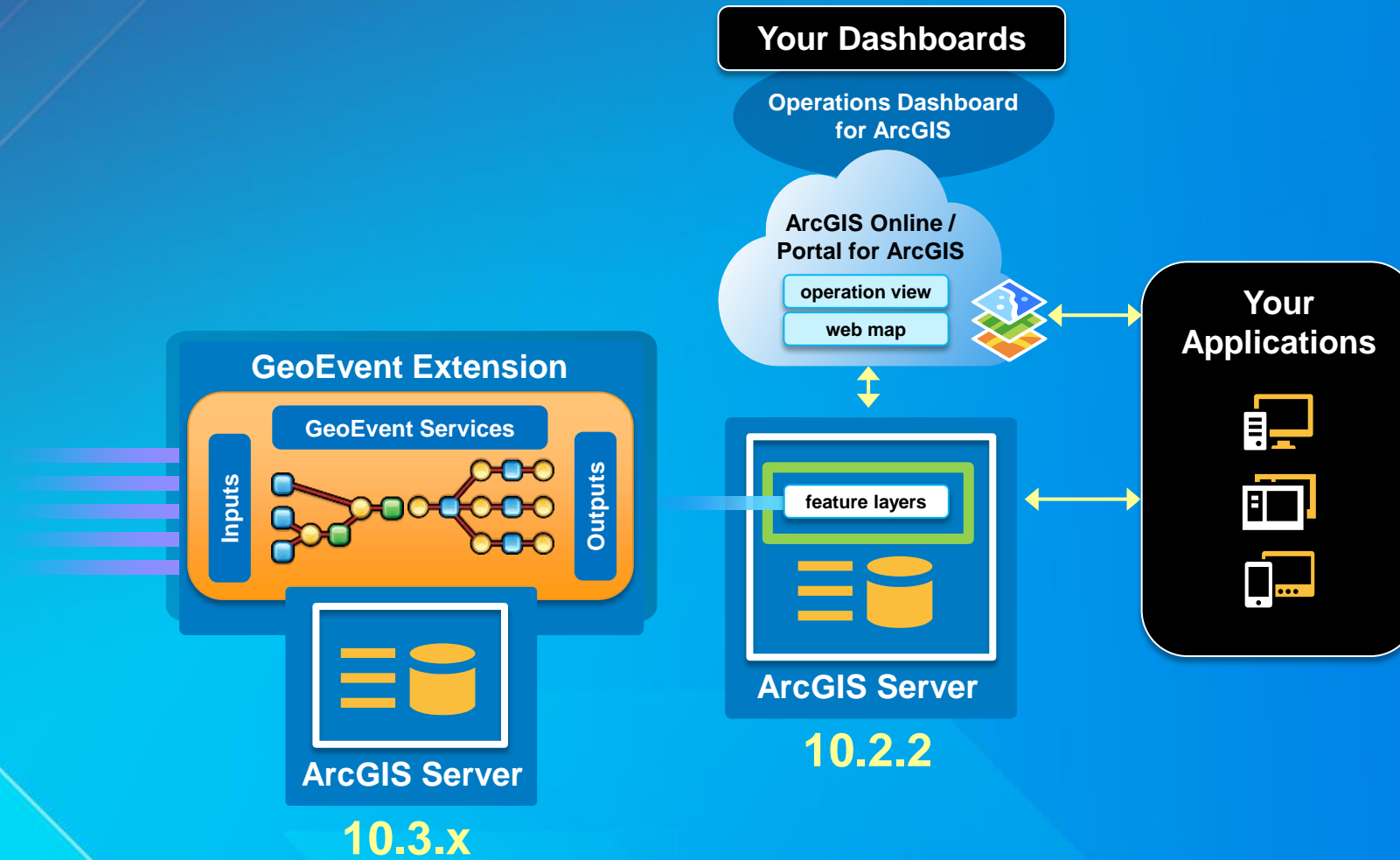
RESTful Discovery

Using local feature services



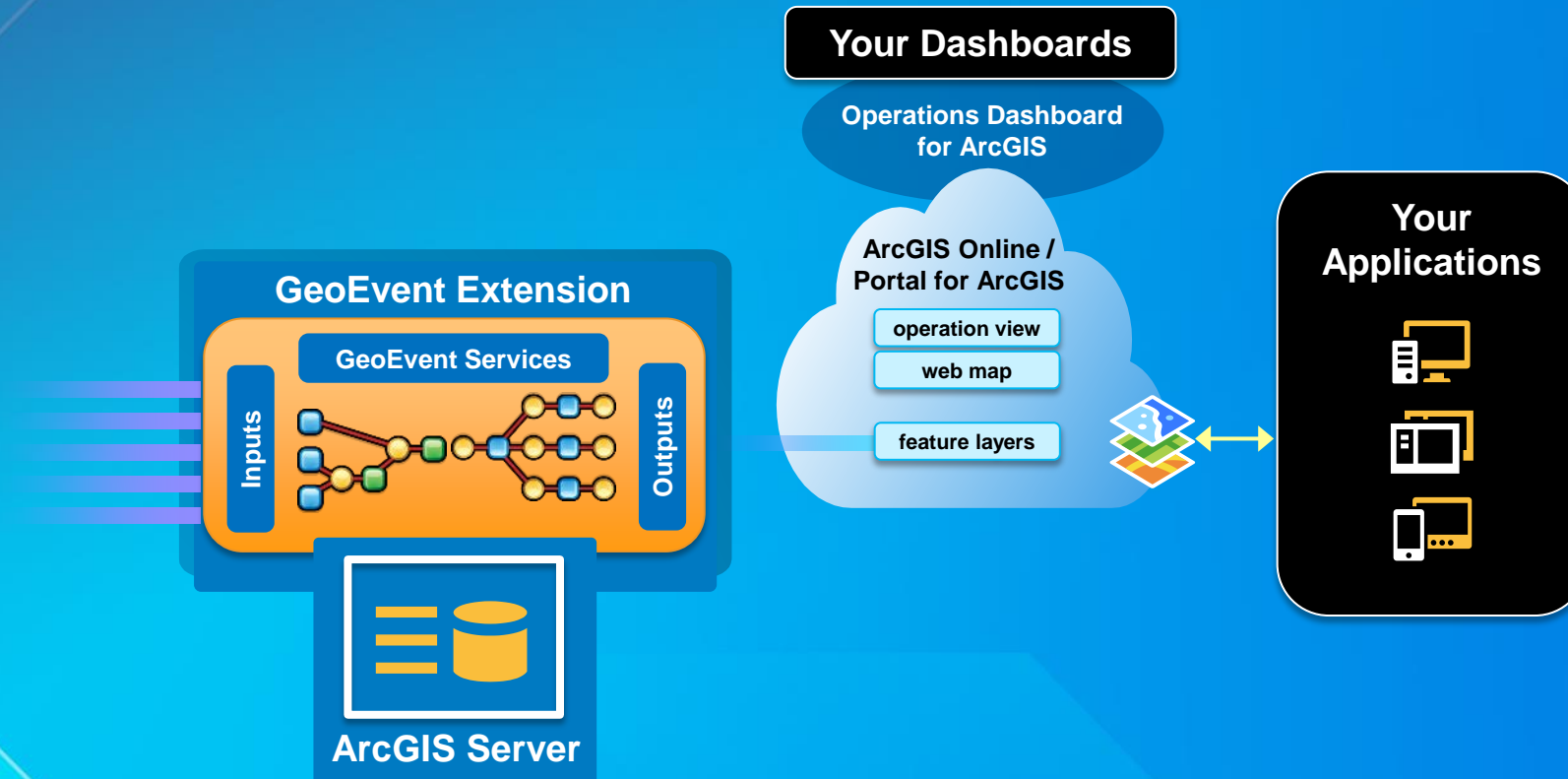
RESTful Discovery

Using remote feature services



RESTful Discovery

Using ArcGIS Online / Portal for ArcGIS feature services



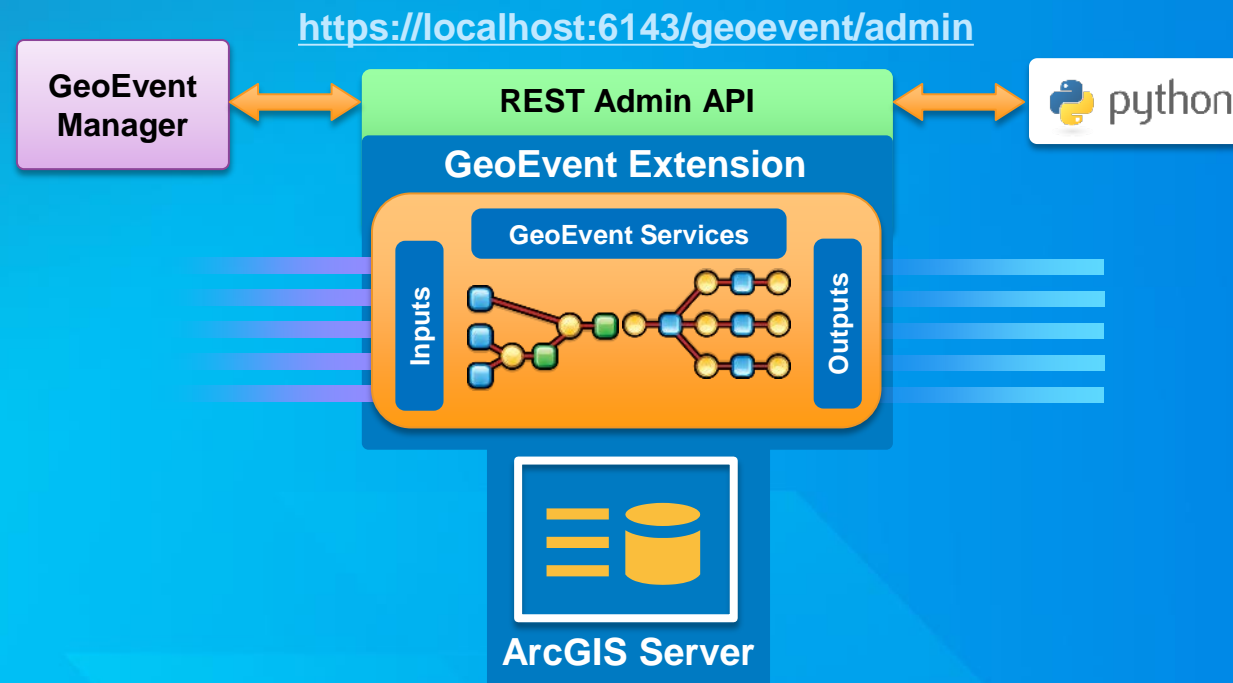


Administering GeoEvent

Administering GeoEvent

REST Admin API

- You can manage GeoEvent programmatically using a complete set of REST administrative endpoints.
- GeoEvent Manager exclusively uses the REST Admin API



Administering GeoEvent

REST Admin API

- You can manage GeoEvent programmatically using a complete set of REST administrative endpoints.
- GeoEvent Manager exclusively uses the REST Admin API

ArcGIS GeoEvent Extension for Server

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[JSON](#) | [XML](#)

Current Version: 10.31

GeoEvent Services

Inputs

Outputs

GeoEvent Definitions

- [incident](#) (4da3d17b-e6cc-4546-95f8-17de64ae805b)
- [TrackGap](#) (81dee9c4-3691-433e-aa35-d1f8daf6e0cb)
- [TweetStatus](#) (e85f2f97-fd9b-4bcd-aa52-26612b7dee6e)

Tags

- [GEOMETRY](#) (The point, polygon, or polyline of the observation.)
- [TIME_END](#) (The end time of the observation)
- [TIME_START](#) (The start time of the observation.)
- [TRACK_ID](#) (The unique id of the entity being Tracked.)

Administering GeoEvent

REST Admin API



ArcGIS GeoEvent Extension for Server [Logout](#)

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[JSON](#) | [XML](#)

Current Version: 10.31

GeoEvent Services

- [asset-monitor](#)

Inputs

- [tcp-text-in](#) (esri-in-tcp-text-generictext)

Outputs

- [alert-fs-out](#) (esri-out-json-fs-update)
- [email-text-out](#) (esri-out-message-email-send)
- [sms-text-out](#) (esri-out-message-sms-send)
- [vehicle-fs-out](#) (esri-out-json-fs-update)

GeoEvent Definitions

- [Ambulance](#) (ed7f9b8d-e20d-46eb-a48e-779091e8a147)
- [incident](#) (8cff36ec-2edf-41fa-935a-73de2b3ea917)
- [TrackGap](#) (8f553742-c134-451e-861b-a66040a7d98d)
- [TweetStatus](#) (32ee041f-21db-4e62-b562-d2dfaabda672)

Tags

- [GEOMETRY](#) (The point, polygon, or polyline of the observation.)
- [SPEED](#) (The speed in mph.)
- [TIME_END](#) (The end time of the observation)
- [TIME_START](#) (The start time of the observation.)
- [TRACK_ID](#) (The unique id of the entity being Tracked.)

Connectors

Real-Time GIS: GeoEvent Extension

Summary

- **ArcGIS is a dynamic platform that enables continuous analytics and real-time visualization of your streaming data.**
- **The Real-Time GIS capabilities allow you to:**
 - know what is happening, as it happens
 - react and make smarter decisions faster
 - be notified when events of interest occur

Other Real-Time GIS (RT GIS) Sessions

- **RT GIS: Applying Real-Time Analytics**
 - Wed 8:30-9:45am, Room 14 B
- **RT GIS: Leveraging Stream Services**
 - Wed 8:30-9:45am, Ballroom 06 D
- **RT GIS: GeoEvent Extension**
 - Wed 10:15-11:30am, Room 14 B
- **RT GIS: The Road Ahead**
 - Wed 1:30-2:45pm, Room 14 B
- **RT GIS: Best Practices**
 - Thu 8:30-9:45am, Room 14 B
- **Real-Time GIS Use Cases and Implementation Patterns**
 - Tue 2:30-3:15pm, Demo Theater 6 – GeoData
- **Anomaly Detection and Alerting for Public Safety with the GeoEvent Extension**
 - 4:30-4:55pm, Demo Theater 3 – Public Safety
- **Real-Time GIS for Asset Readiness, Event Preparation, and Intervention**
 - Thu 8:30-9:45am, Room 29 C

Want to learn more?

Resources

- To learn more, visit the 'Get Started' area of the GeoEvent Extension resource site:

- <http://links.esri.com/geoevent>

- Introduction
- Notifications
- Stream Services
- RSS, HTTP, Files
- REST Admin API
- Clustering



Open ▾ Details



Open ▾ Details

Tutorial - Introduction to GeoEvent

This tutorial is the first in a series of tutorials introducing you to the capabilities of ArcGIS GeoEvent Extension for Server.

 Document Link by GeoEventTeam

Last Modified: December 30, 2014

☆☆☆☆☆ (0 ratings, 0 comments, 11 views)

Tutorial - Stream Services in GeoEvent

The Stream Services in GeoEvent tutorial introduces you to stream services, a new type of ArcGIS for Server service which emphasizes low latency, real-time data dissemination for client/server data flows.

 Document Link by GeoEventTeam

Last Modified: December 30, 2014

☆☆☆☆☆ (0 ratings, 0 comments, 18 views)

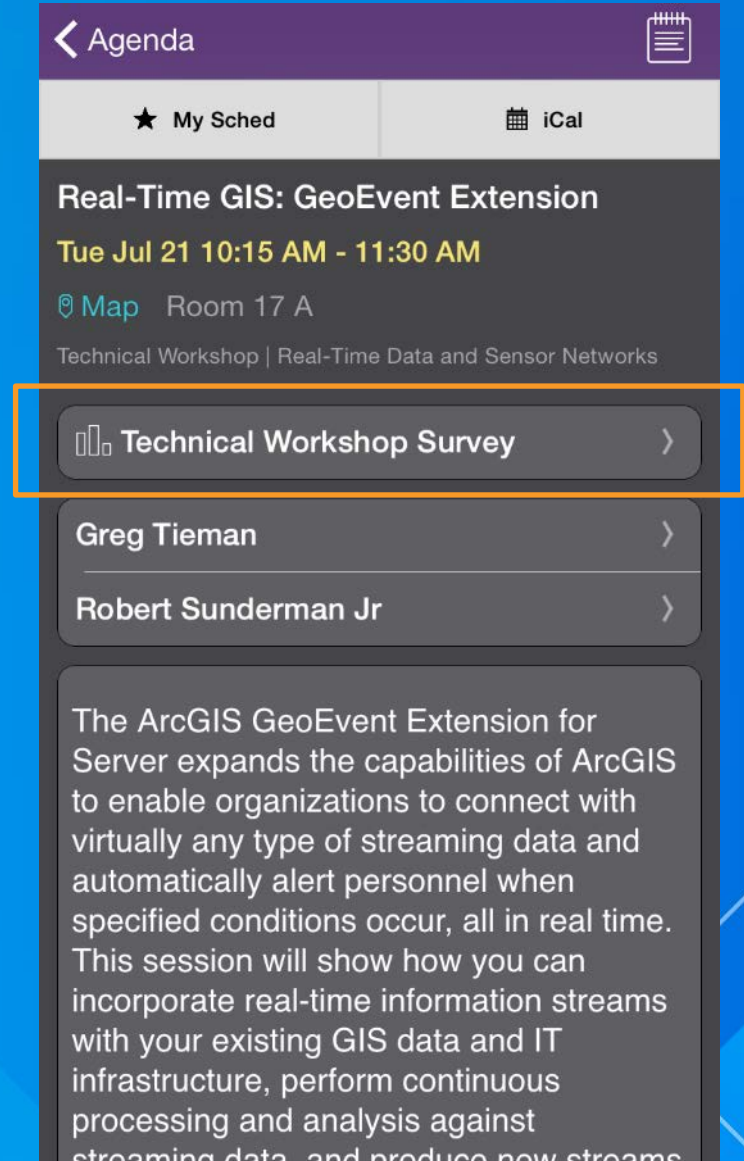
- Join the community on the GeoEvent Forum:

- <https://links.esri.com/geoevent-forum>

Thank you...

Session Survey

- Please fill out the session survey in the Esri Events app
- Search for this workshop
- Click **Technical Workshop Survey**
- Answer a few short questions and enter any comments



Questions / Feedback?



Understanding our world.

To learn more:

<http://links.esri.com/geoevent>

<https://links.esri.com/geoevent-forum>