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ArcGIS GeoEvent Processor for Server: An Introduction

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Agenda

- Real-time GIS overview
- Working with real-time data
- Performing continuous processing and analysis

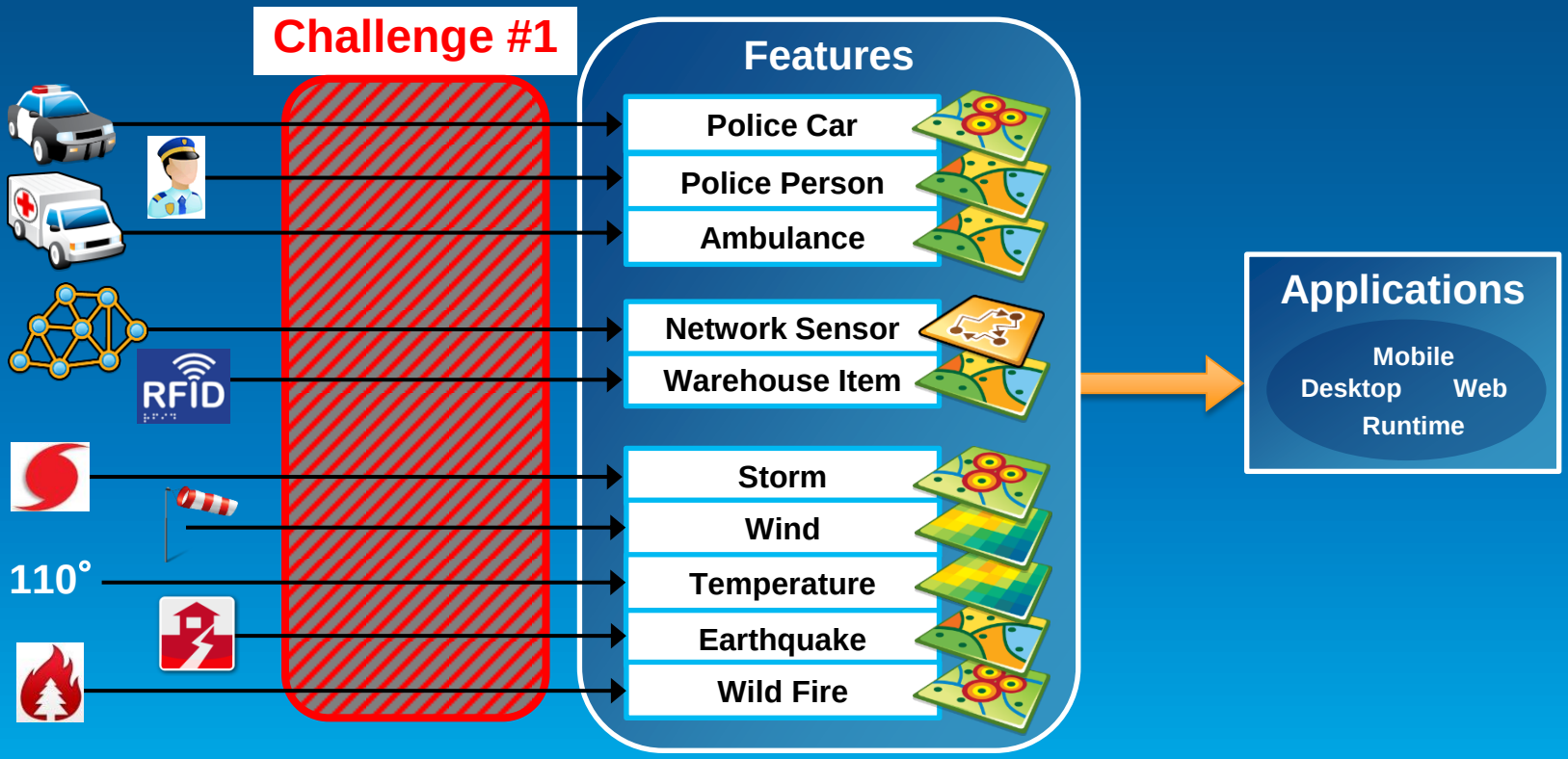
GIS data

- **GIS data typically represents state at a specific moment in time: “historic”, “current”, or “future”.**

Credit: iStockphoto/chris_lemmens

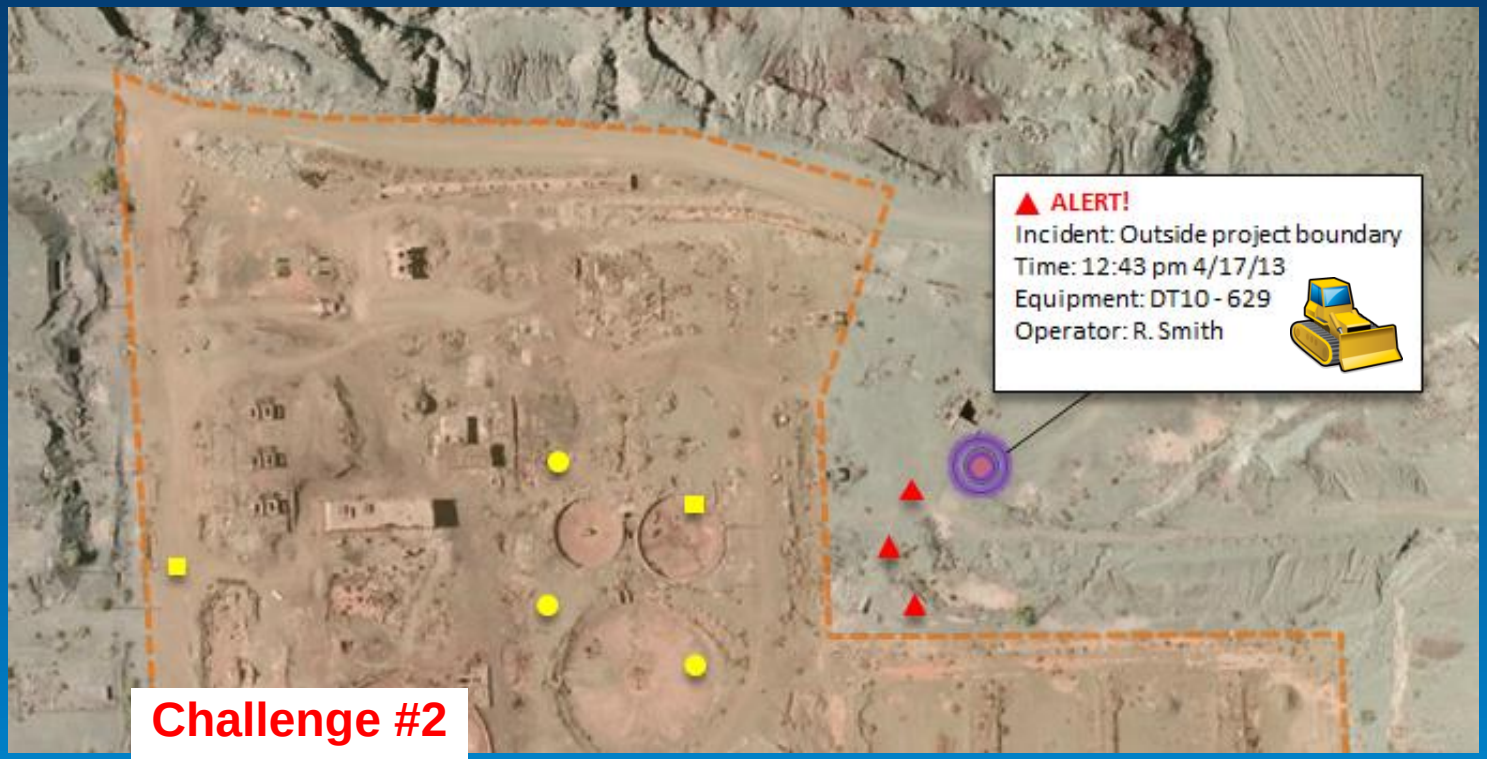
Real-time GIS data

- 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

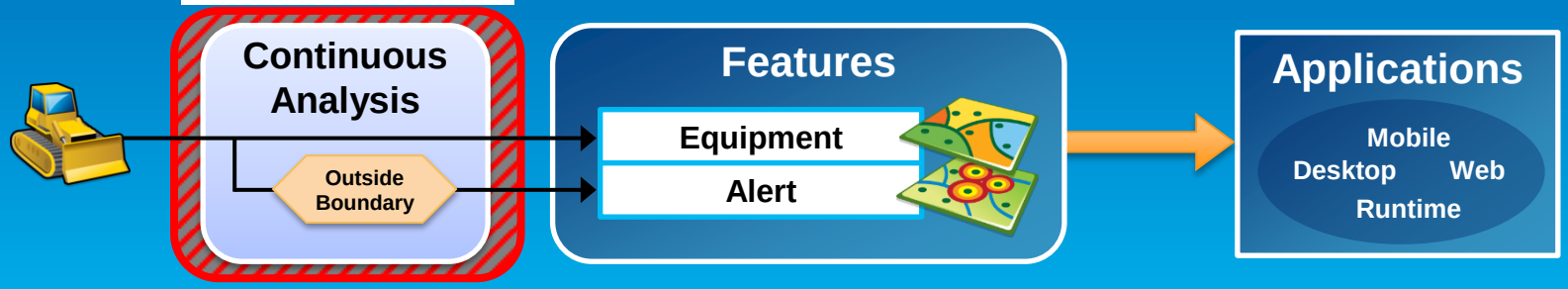


Analyzing real-time GIS data

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

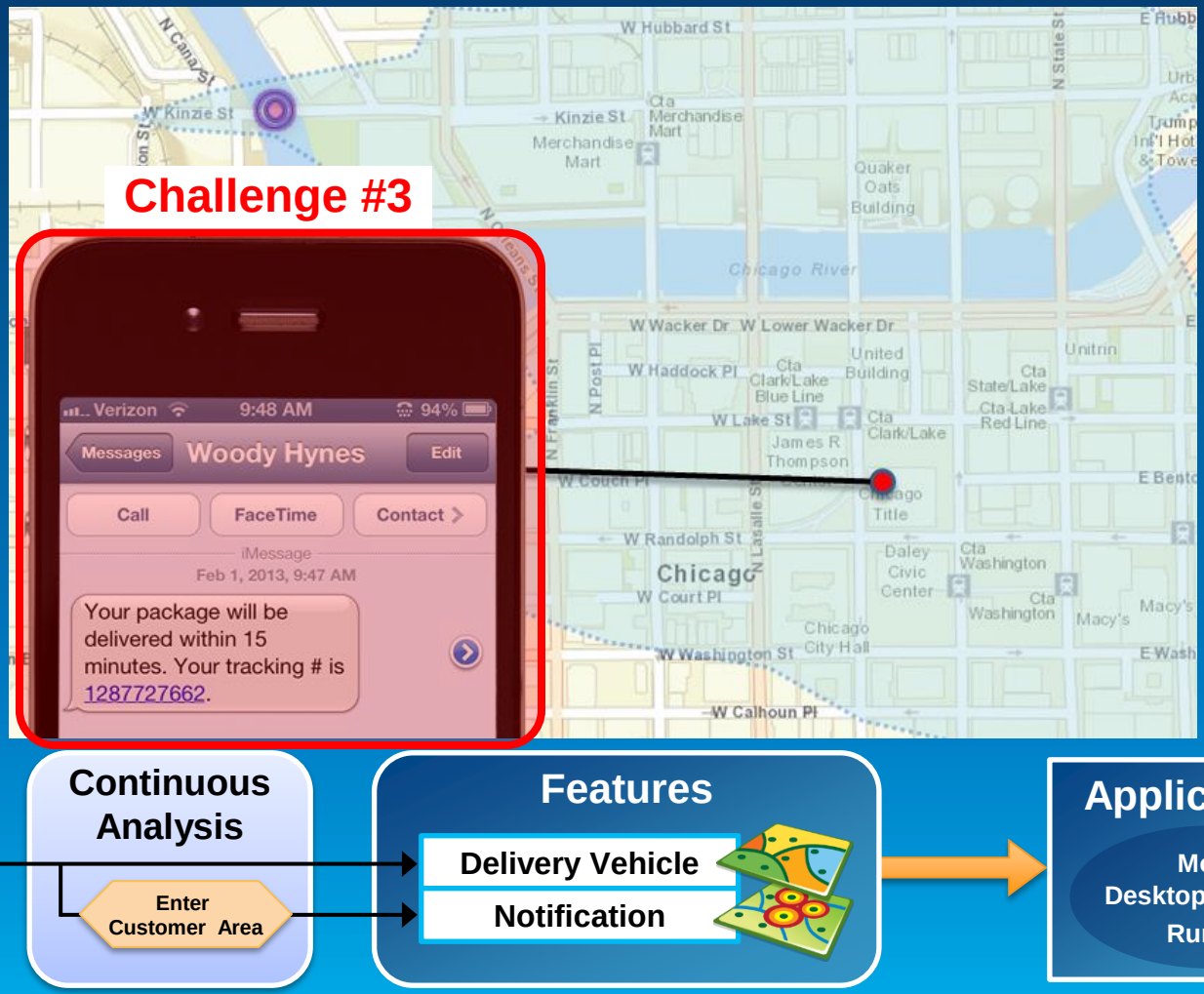


Challenge #2

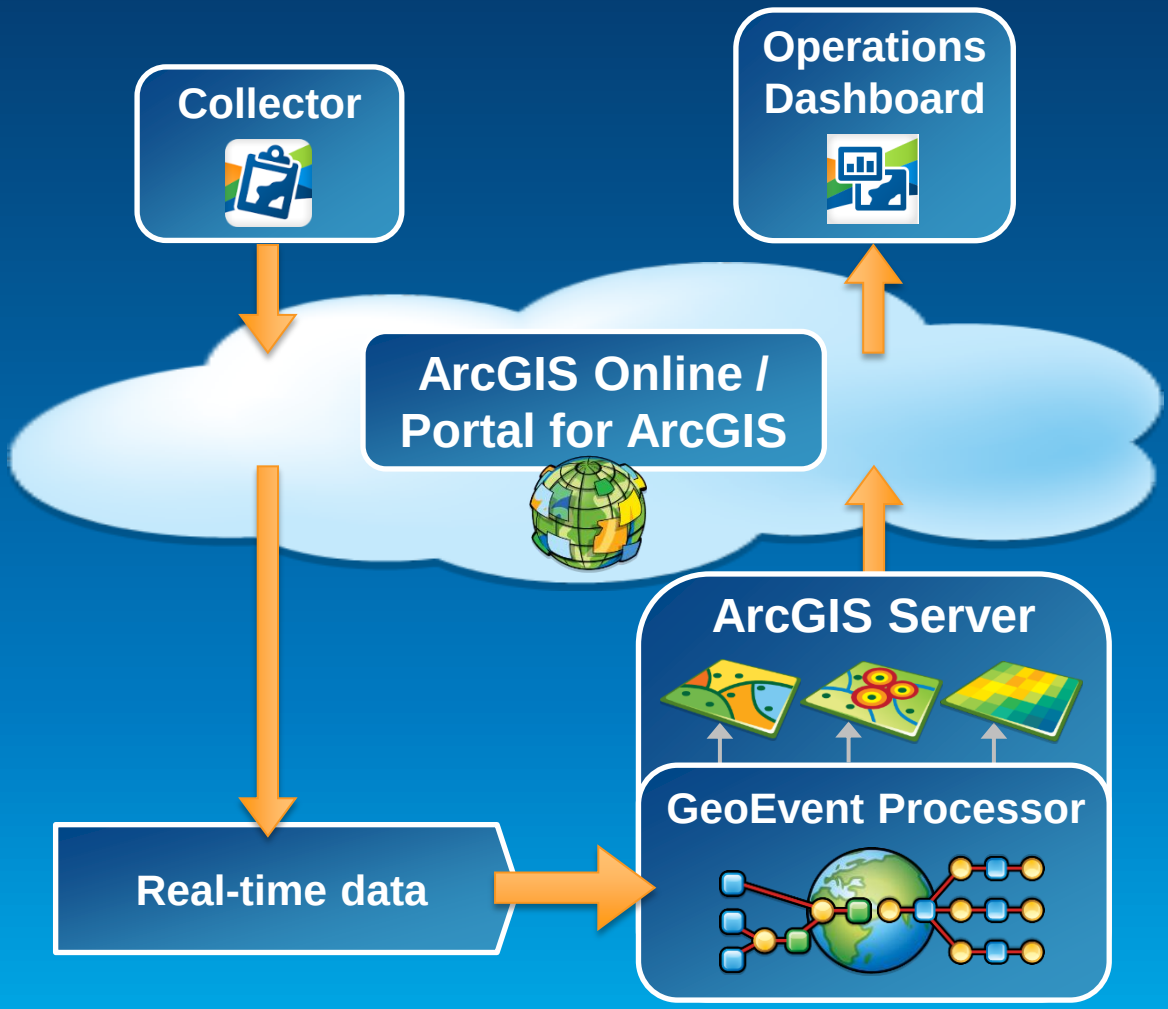


Analyzing real-time GIS data

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

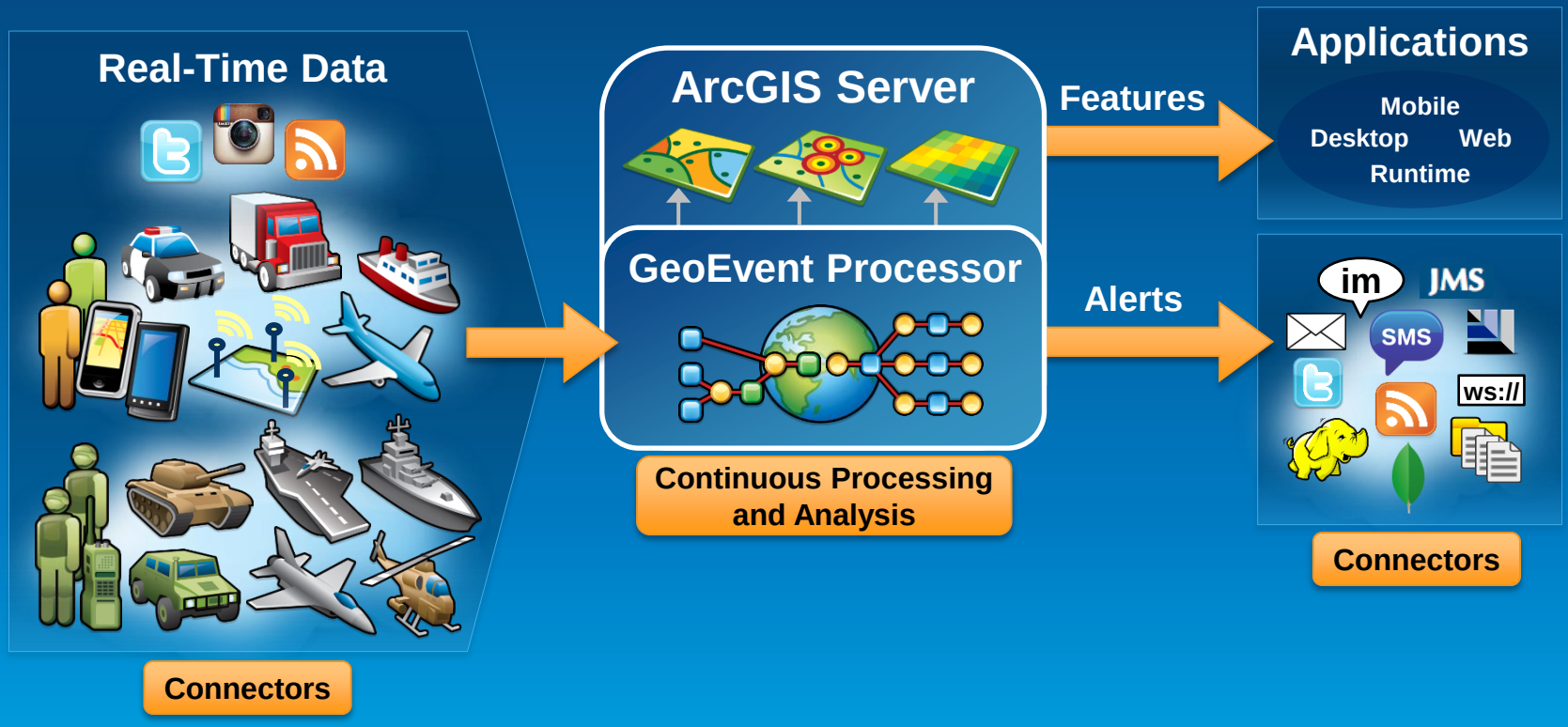


ArcGIS supports real-time GIS



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

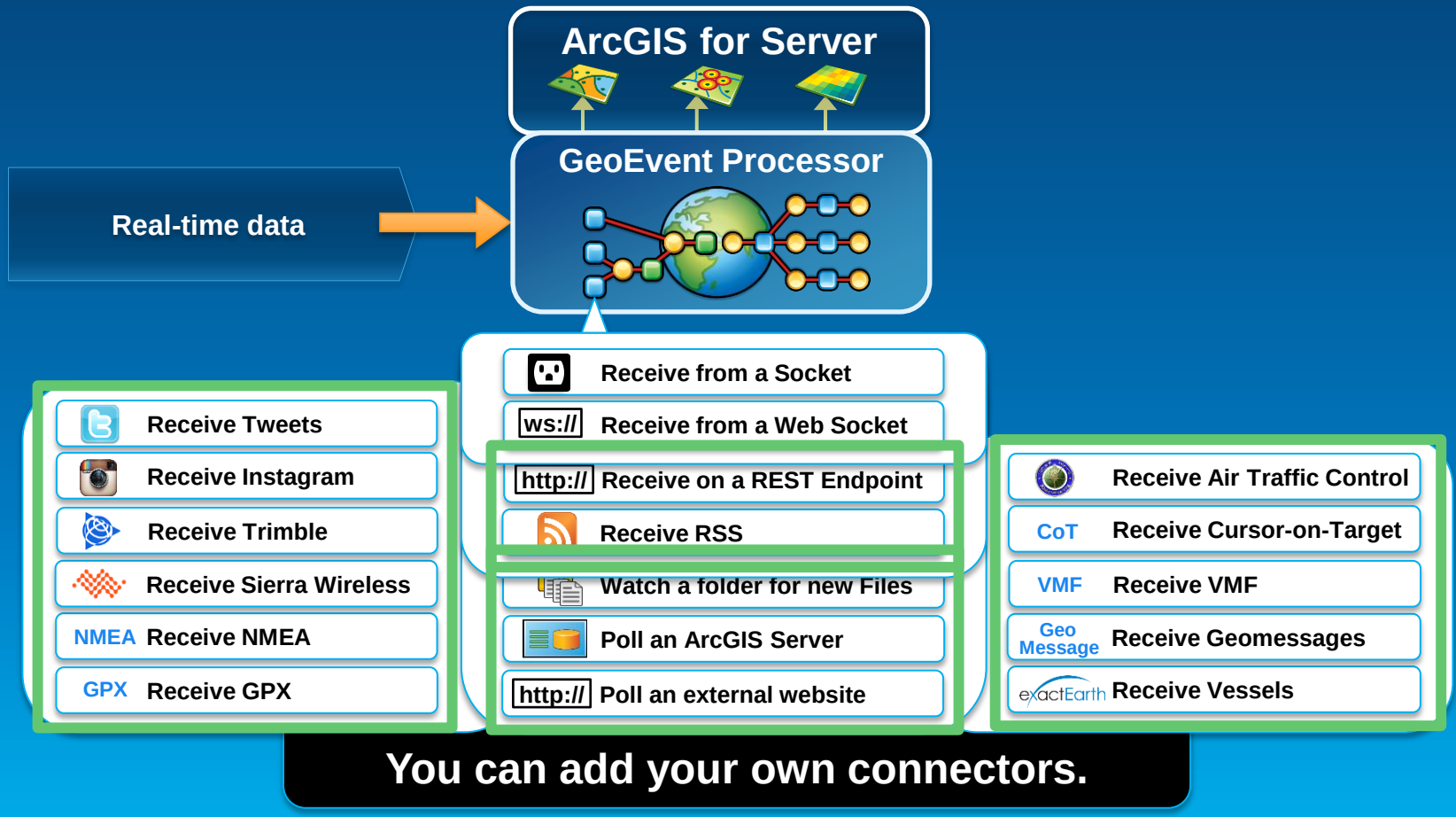


Working with real-time data

Receiving real-time data

Input connectors

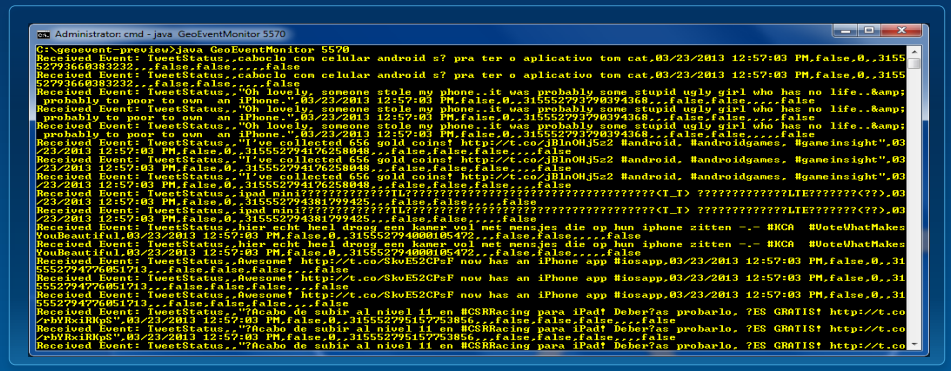
- You can easily integrate real-time data with ArcGIS by using a connector that meets your needs.



Demo

Demonstration

Twitter monitoring

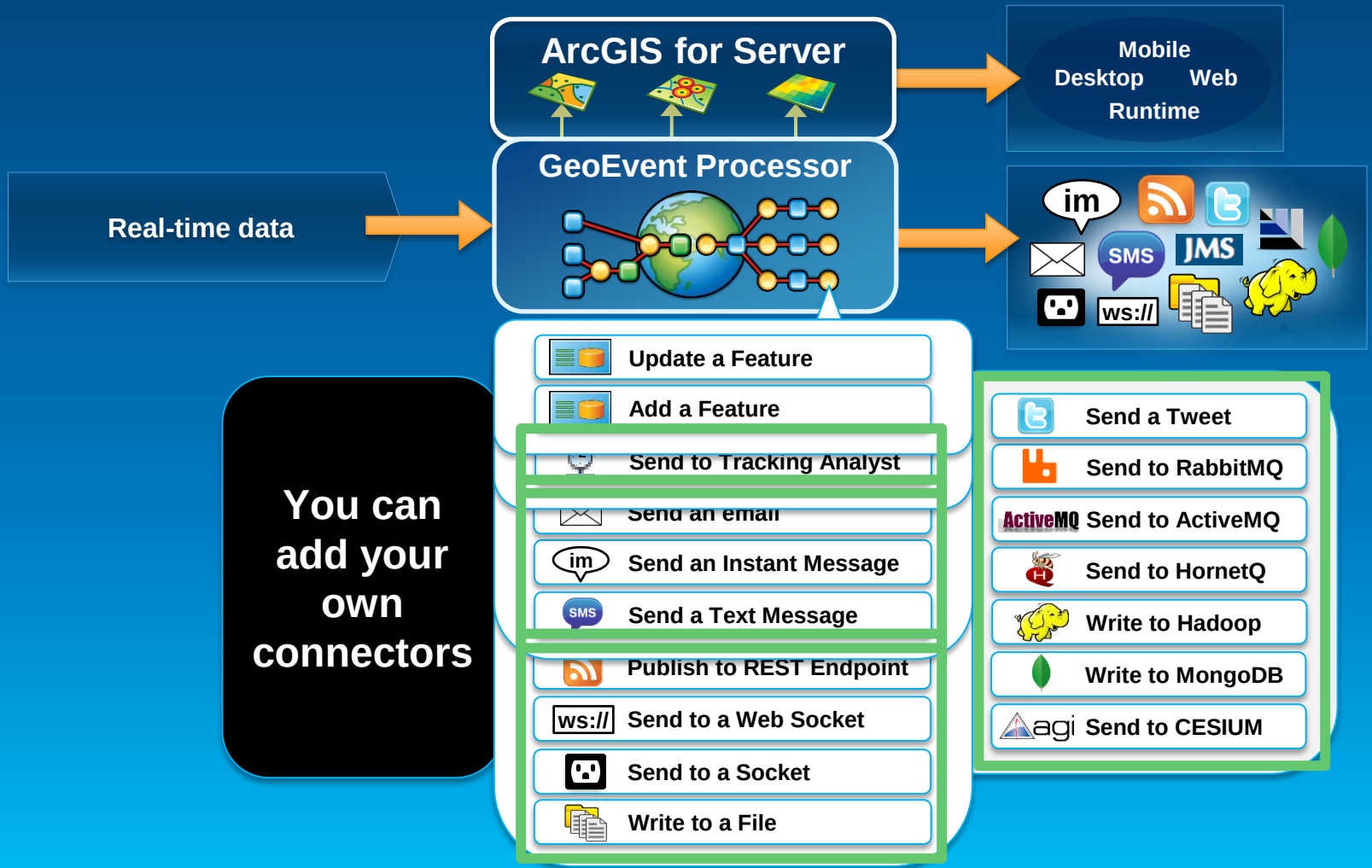


Name	Status	Count	Rate (over last 5 mins)		Max Rate	Time Since Last
tweet-fs-out	STARTED	40	0.39 /sec		0.64 /sec	00:00:00
tcp-text-out	STARTED	6566	64.37 /sec		65.07 /sec	00:00:00

Sending real-time data

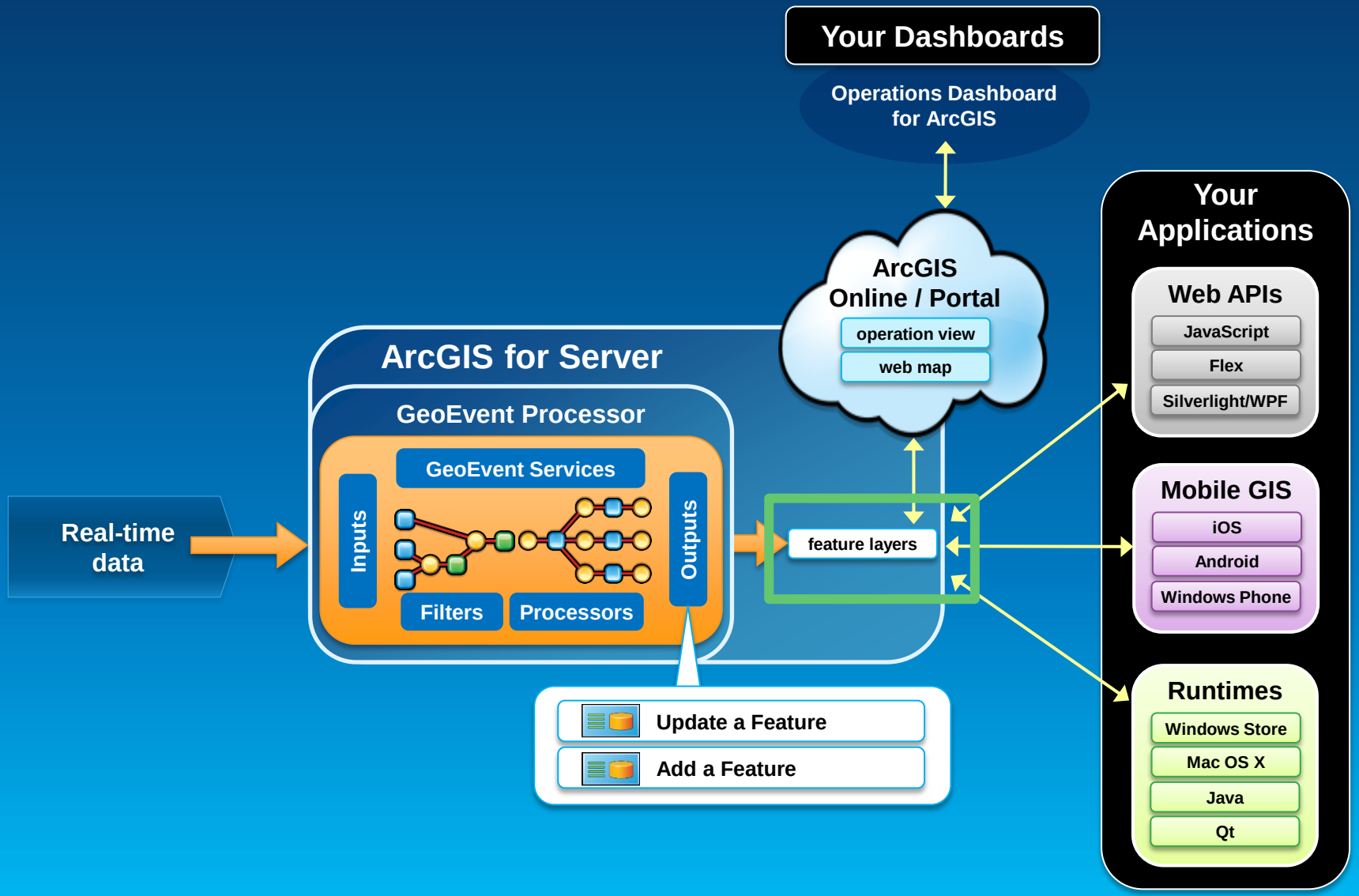
Output connectors

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



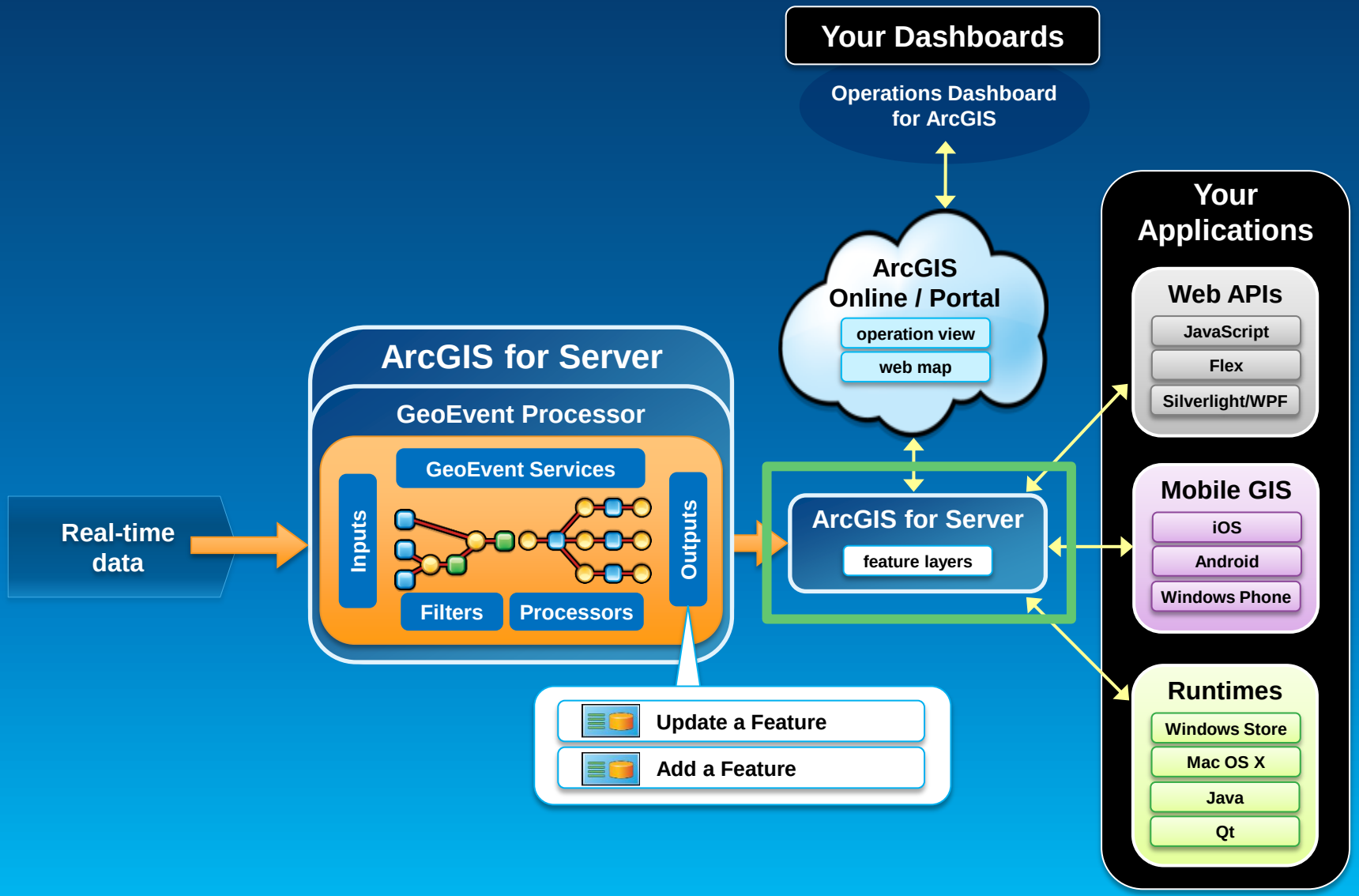
Sending real-time data to features

Using local feature services



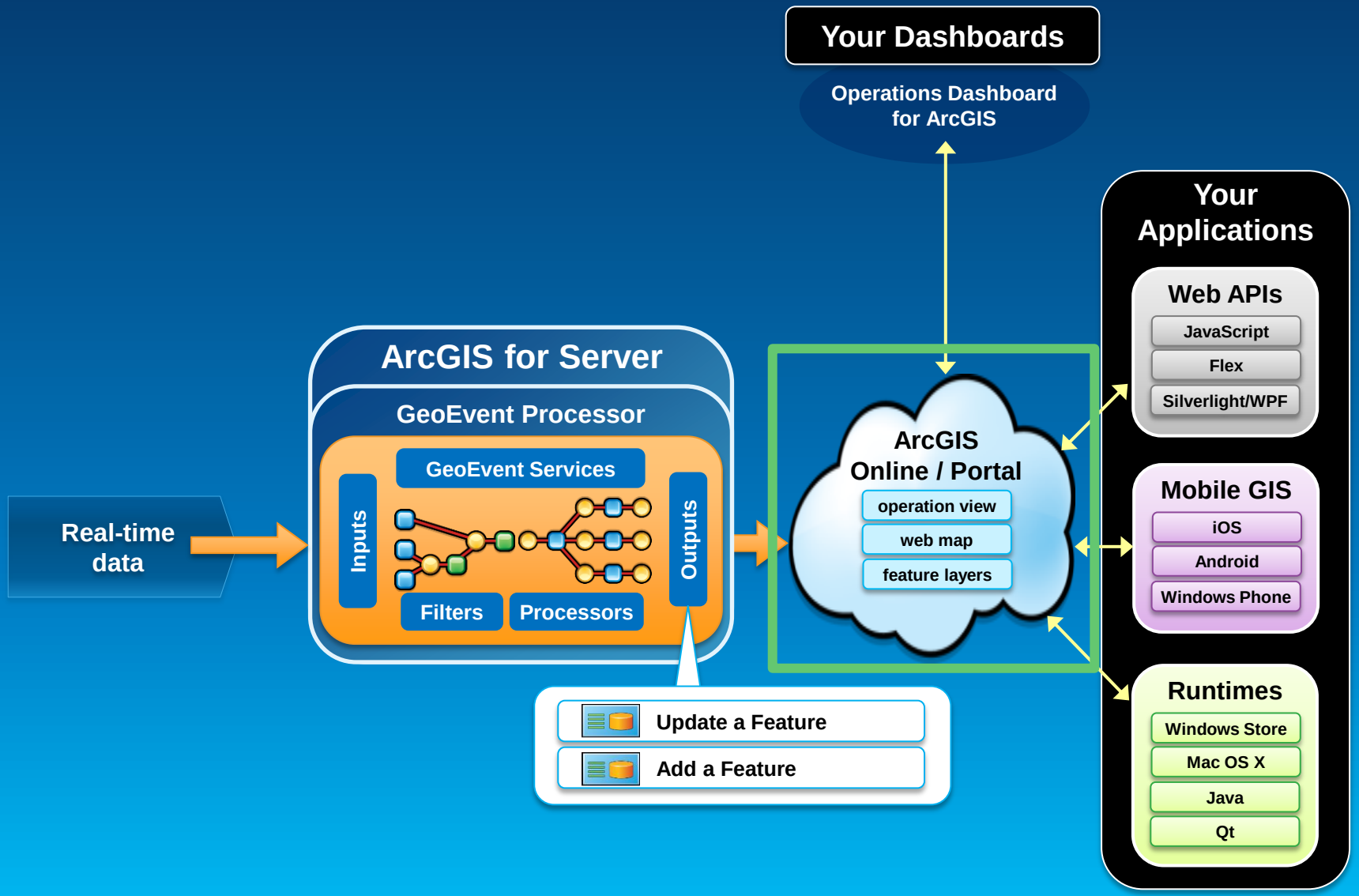
Sending real-time data to features

Using remote feature services



Sending real-time data to features

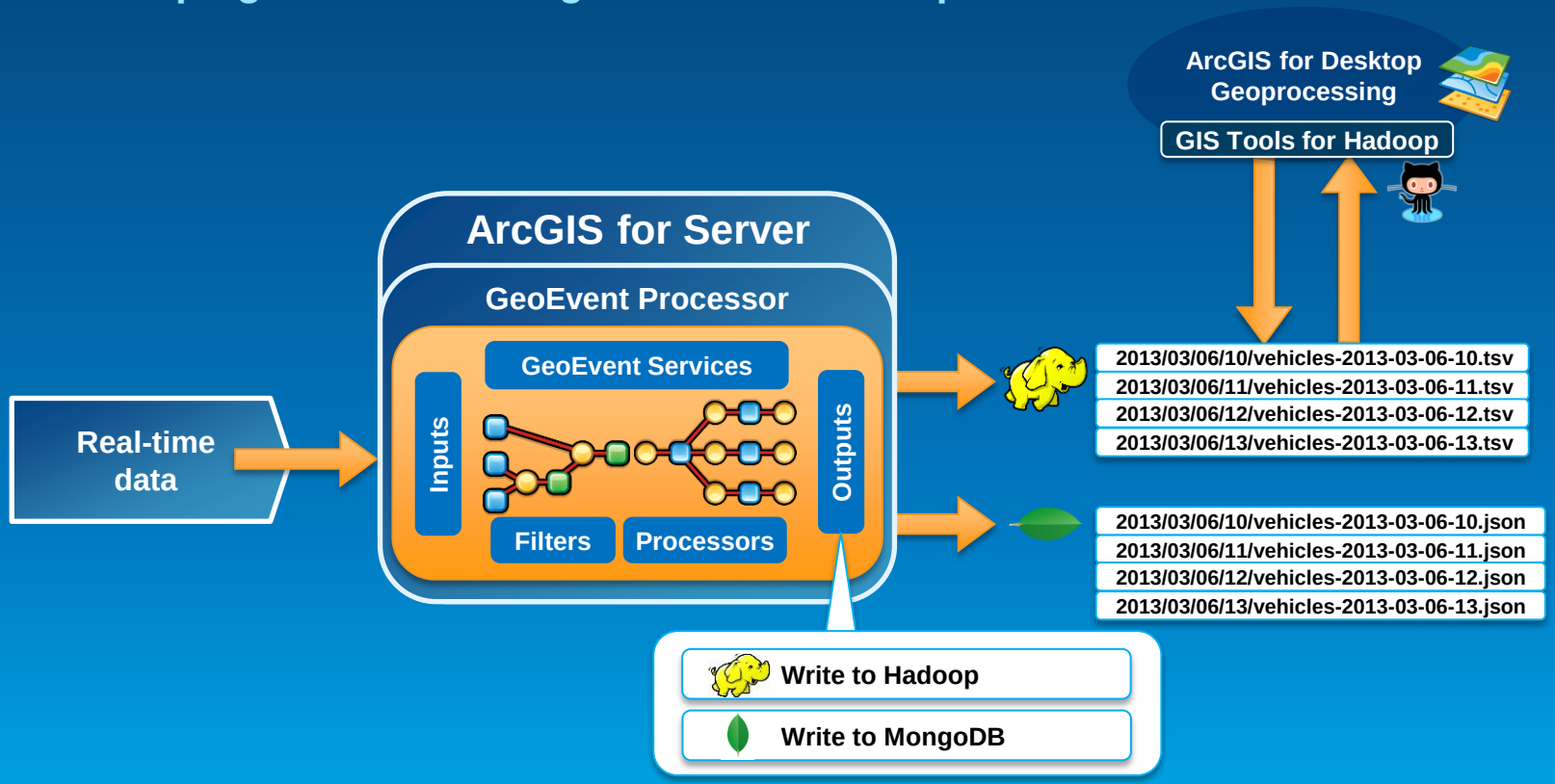
Using ArcGIS Online feature services



Sending real-time data to big data stores

Write to a Hadoop Distributed File System (HDFS)
Write to a MongoDB Document Store

- **GIS Tools for Hadoop**
  - http://github.com/Esri/gis-tools-for-hadoop

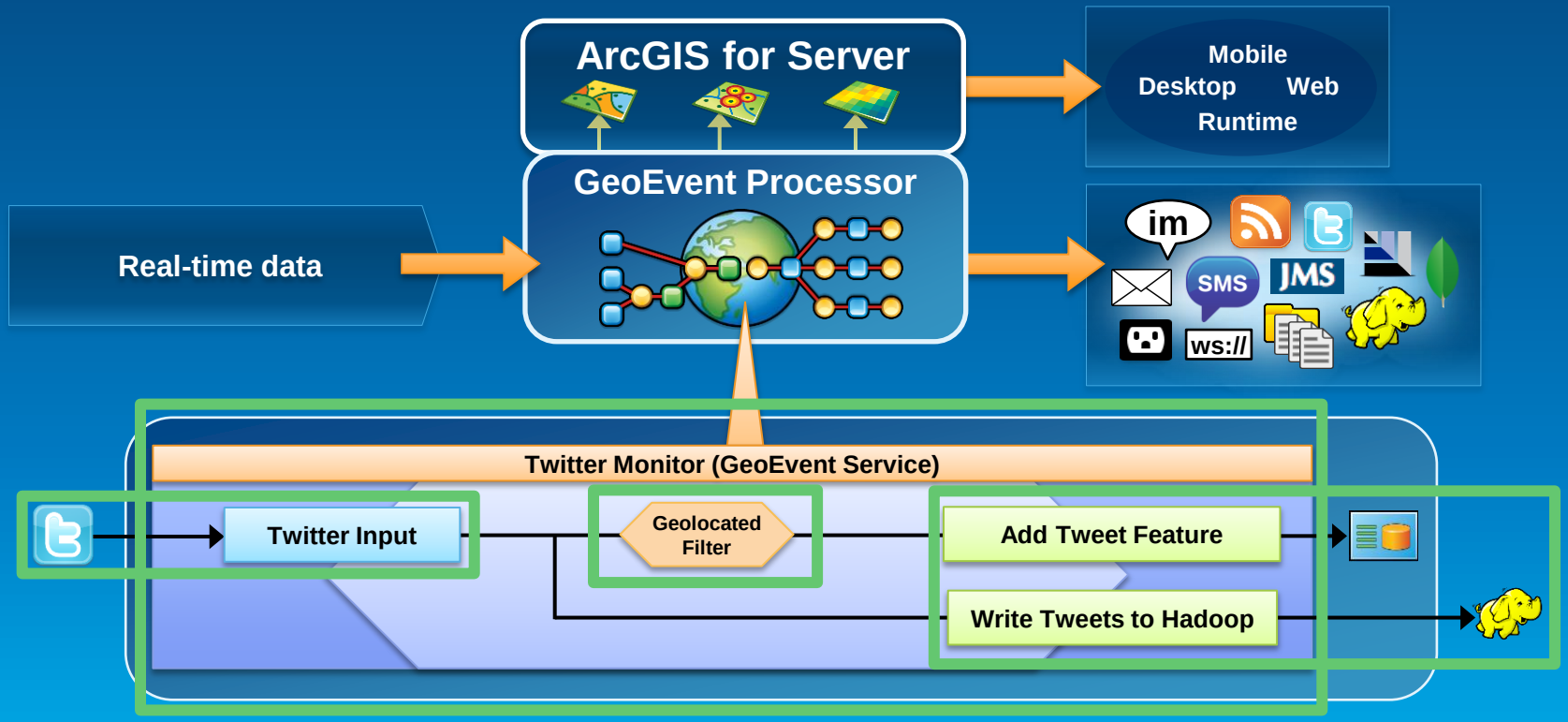


Performing continuous processing and analysis

Continuous processing and analysis

GeoEvent Services

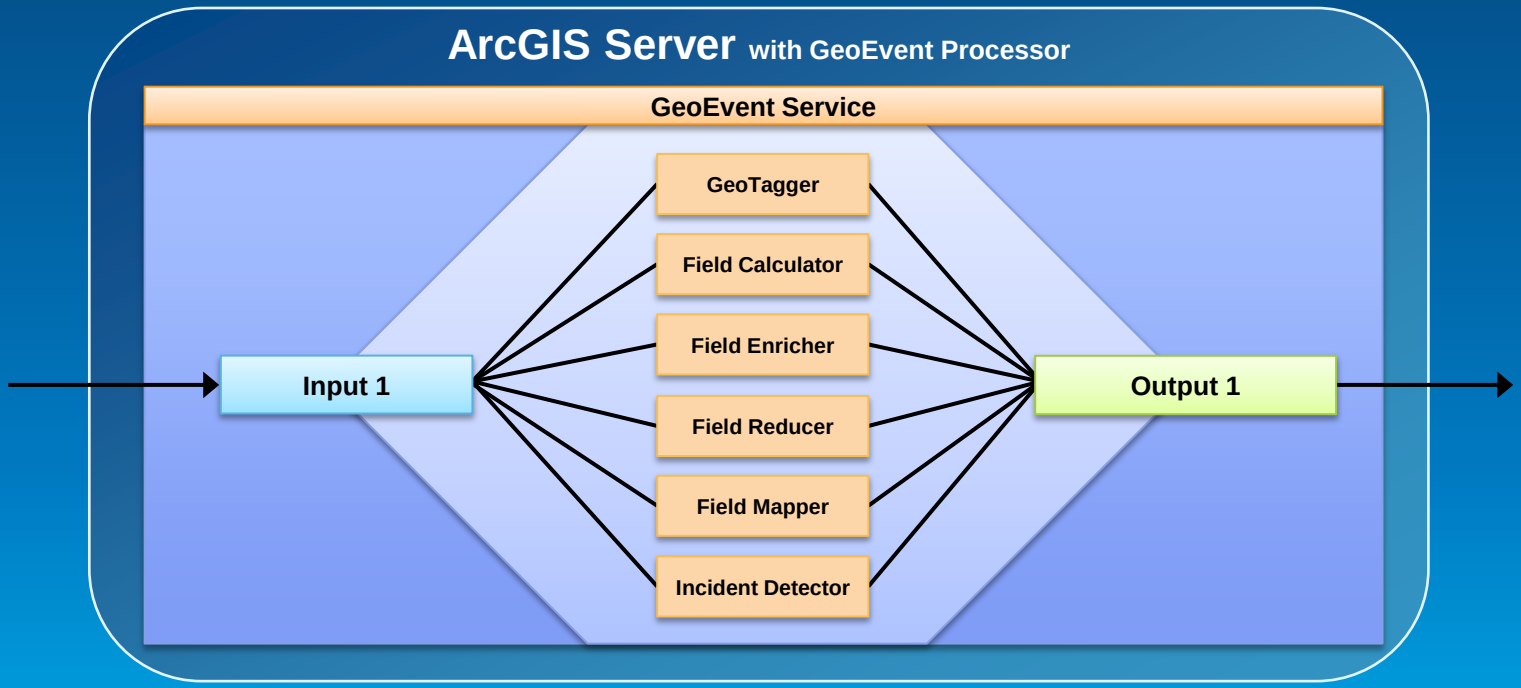
- A GeoEvent Service configures the flow of GeoEvents,
  - the Filtering and GeoEvent Processing steps to perform,
  - what input(s) to apply them to,
  - and what outputs(s) to send the results to.



Continuous processing and analysis

Processors

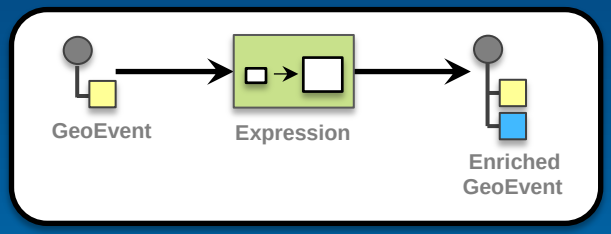
- Calculate new fields on a geoevent: Field Calculator, GeoTagger
- Modify a geoevent: Field Enricher, Field Reducer
- Derive a new geoevent: Field Mapper, Incident Detector



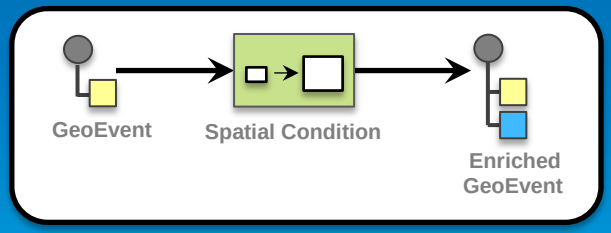
Processors

Calculate new field on a geoevent

- A **Field Calculator** processor uses an expression to
  - calculate a new field or update an existing field.
  - Expressions can be mathematical expressions or regular expressions.



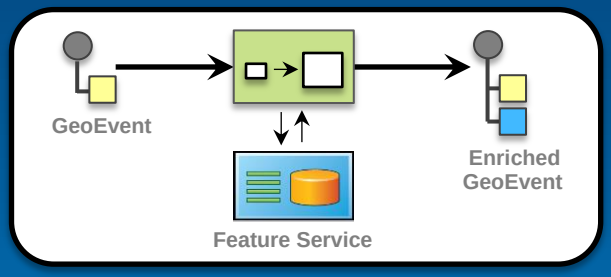
- A **GeoTagger** processor
  - uses a spatial condition to tag the event with related geometries.



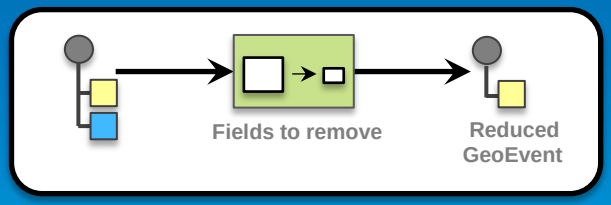
Processors

Modify a geoevent

- A Field Enricher processor
  - enriches the geoevent with new fields derived from a data source: feature service or file.



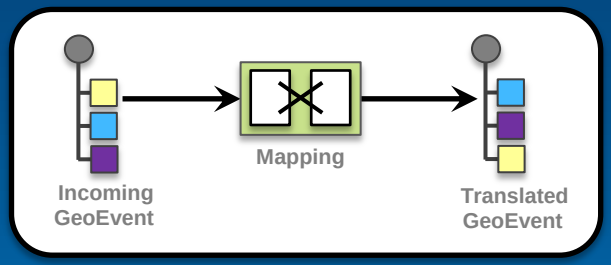
- A Field Reducer processor
  - removes fields from a geoevent.



Processors

Derive a new geoevent

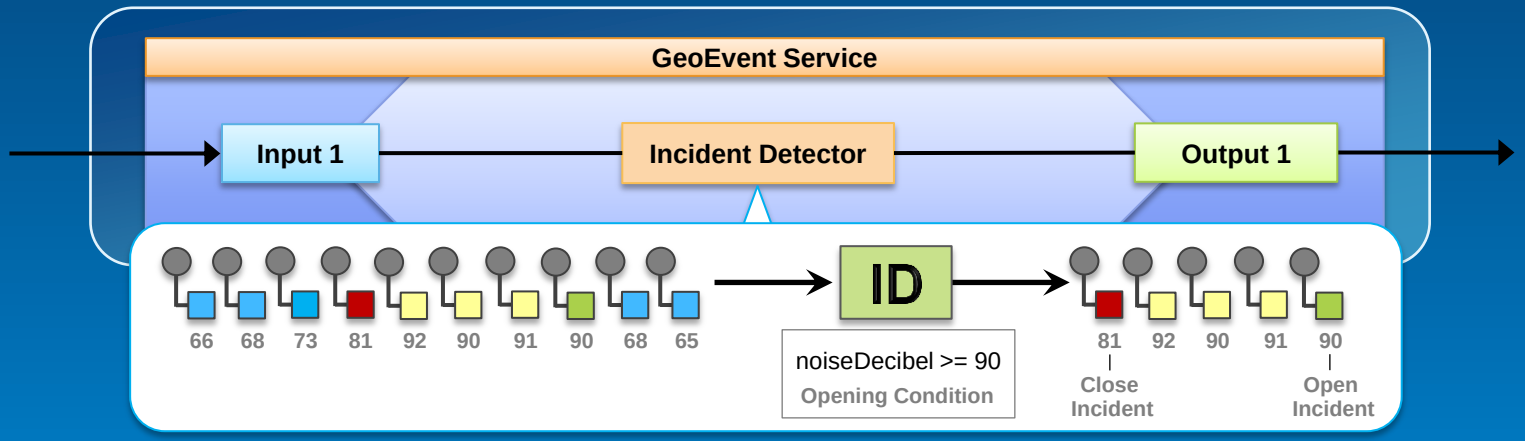
- A Field Mapper processor
  - translates from one geoevent format to another.



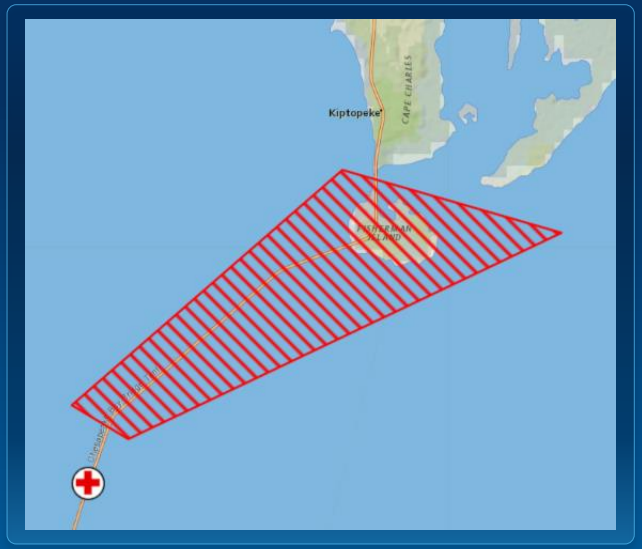
Continuous processing and analysis

Derive a new geoevent

- An **Incident Detector** processor
  - creates an incident upon an opening condition being met,
  - maintains state for the duration of the incident,
  - closes the incident based on a closing condition or expiration.



Demo

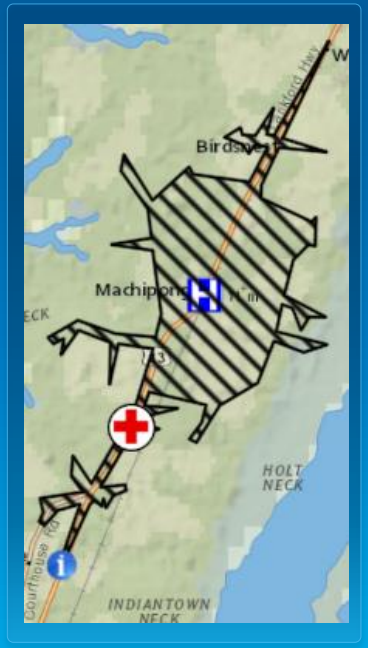


Demonstration

Ambulance monitoring

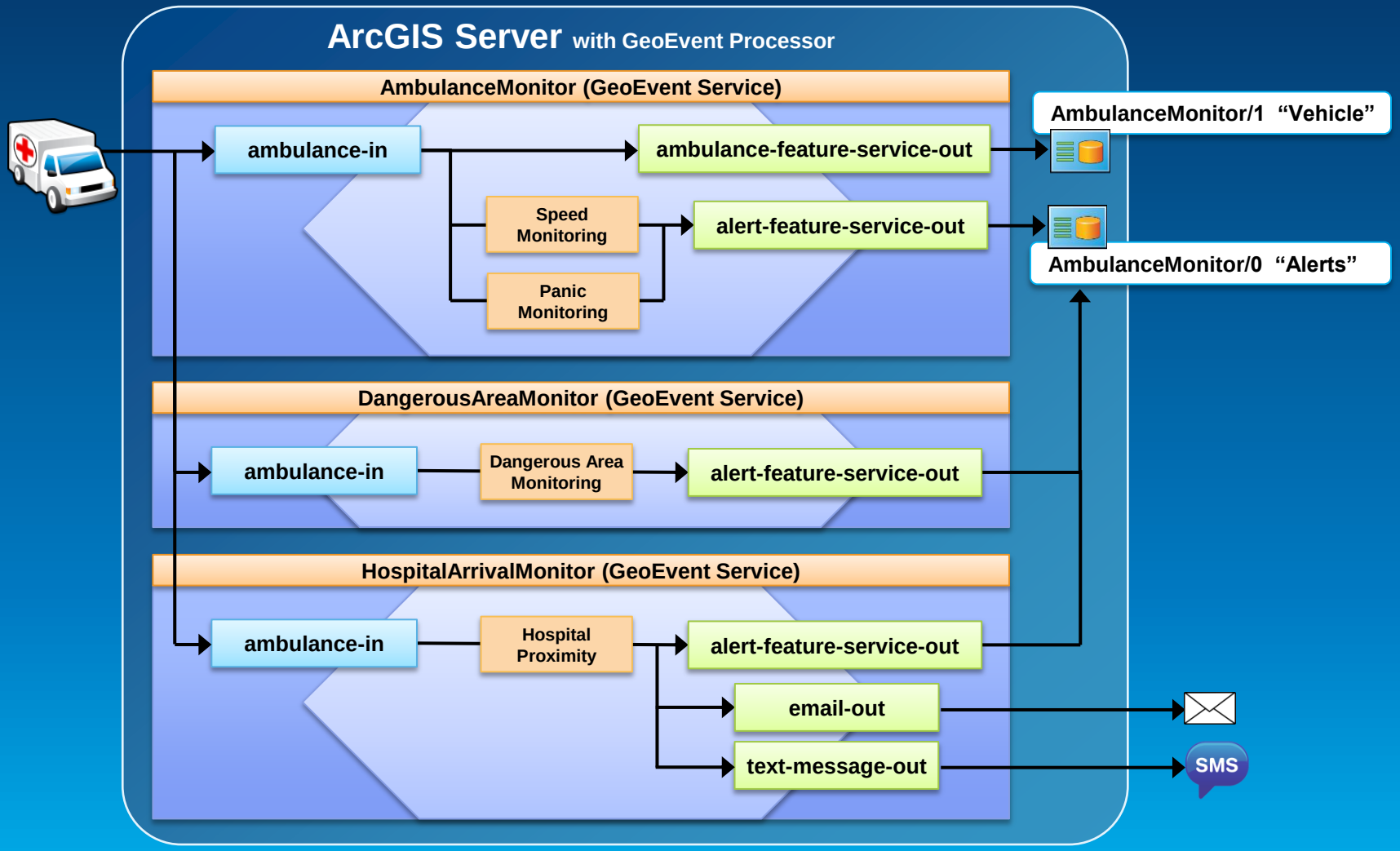
Alerts

- AMB-15 is approching Hospital, Started at Sun Mar 24 02:19:00 PDT 2013
- AMB-15 is inside a Dangerous area, Ended at Sun Mar 24 01:56:00 PDT 2013 and lasted for 13 minutes.
- AMB-15 is speeding, Ended at Sun Mar 24 01:25:00 PDT 2013 and lasted for 8 minutes.



Processors

Using an incident detector to monitor conditions



Solutions and sample applications

Applying real-time GIS

- A number of sample applications and solutions leverage GeoEvent Processor to enable real-time GIS capabilities within them including:
  - Defense and Intelligence: http://resources.arcgis.com/en/communities/defense-and-intelligence/
    - ArcGIS for the Military
    - ArcGIS for the National Guard
    - ArcGIS for Intelligence
  - Asset Monitor
  - Route Monitor

Real-time GIS with GeoEvent Processor

Summary

- **ArcGIS is a dynamic platform that enables real-time visualization, continuous analysis, and understanding of our world.**

- **GeoEvent Processor allows you to:**
  - **be alerted when interesting events occur**
  - **react and make smarter decisions faster**
  - **to know what is happening, as it happens**

- **Product Page**
  - **http://pro.arcgis.com/share/geoevent-processor**

  - **Dlaw@esri.com**

Understanding our world.