Exploiting Real-Time Data with ArcGIS GeoEvent Processor for Server

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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

...continuous stream of events flowing from sensors representing the latest state.
Analyzing real-time GIS data

Challenge #2

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.

Continuous Analysis
- Enter Customer Area

Features
- Delivery Vehicle Notification

Applications
- Mobile
- Desktop
- Web
- Runtime
ArcGIS supports real-time GIS

- Collector
- Operations Dashboard
- ArcGIS Online / Portal for ArcGIS
- ArcGIS Server
- GeoEvent Processor
- Real-time data
ArcGIS GeoEvent Processor for Server

- Receives real-time streaming data
- Performs continuous processing and analysis
- Sends updates and alerts to anyone on any device
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.

You can add your own connectors.
Demonstration

Twitter monitoring

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Count</th>
<th>Rate (over last 5 mins)</th>
<th>Max Rate</th>
<th>Time Since Last</th>
</tr>
</thead>
<tbody>
<tr>
<td>tweet-fs-out</td>
<td>STARTED</td>
<td>40</td>
<td>0.39 /sec</td>
<td>0.64 /sec</td>
<td>00:00:00</td>
</tr>
<tr>
<td>tcp-text-out</td>
<td>STARTED</td>
<td>6566</td>
<td>64.37 /sec</td>
<td>65.07 /sec</td>
<td>00:00:00</td>
</tr>
</tbody>
</table>
Sending real-time data

Output connectors...

- You can easily send resulting streams to anyone on any device using a connector.

You can add your own connectors

Real-time data
Sending real-time data to features
Using local feature services

ArcGIS for Server
GeoEvent Processor
GeoEvent Services
Filters
Processors

Real-time data
Inputs
Outputs

ArcGIS Online / Portal
operation view
web map

Your Dashboards
Operations Dashboard for ArcGIS

Your Applications
Web APIs
JavaScript
Flex
Silverlight/WPF

Mobile GIS
iOS
Android
Windows Phone

Runtimes
Windows Store
Mac OS X
Java
Qt

Update a Feature
Add a Feature

feature layers
Sending real-time data to features

Using remote feature services...

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Sending real-time data to features

Using ArcGIS Online feature services...

ArcGIS for Server
- GeoEvent Processor
  - GeoEvent Services
  - Filters
  - Processors

Real-time data

Outputs

ArcGIS Online / Portal
- operation view
- web map
- feature layers

Your Dashboards

Operations Dashboard for ArcGIS

Your Applications

Web APIs
- JavaScript
- Flex
- Silverlight/WPF

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- Java
- Qt

Update a Feature
Add a Feature
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
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: GeoTagger, Field Calculator
• Modify a geoevent: Field Enricher, Field Reducer
• Derive a new geoevent: Field Mapper, Incident Detector
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.

![Diagram showing GeoEvent Service with input and output 1, an Incident Detector, and decision flow for opening and closing conditions with noiseDecibel >= 90.]
Demonstration
Noise incident detection

- Noise App
  - JSON
  - ArcGIS for Server
    - GeoEvent Processor
    - GeoEvent Service
  - feature
    - incident detector
  - ws://
- GeoEvent Service
  - ArcGIS for Server
  - ws://
  - feature
- ws://
- Excessive Noise at iPhone, Ongoing for last 2 seconds.
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:
    - ArcGIS for the Military
    - ArcGIS for the National Guard
    - ArcGIS for Intelligence
  - Asset Monitor
  - Route Monitor
Demonstration
Vehicle monitoring

Alerts

1. AMB-15 is approaching Hospital. Started at Sun Mar 24 02:19:00 PDT 2013
2. AMB-15 is inside a Dangerous area. Ended at Sun Mar 24 01:56:00 PDT 2013 and lasted for 13 minutes.
3. AMB-15 is speeding. Ended at Sun Mar 24 01:25:00 PDT 2013 and lasted for 8 minutes.
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
questions
& answers?