Extending ArcGIS GeoEvent Processor for Server with New Connectors

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ArcGIS Server supports Real-Time Processing
GeoEvent Processor integrates and exploits streaming data

- GeoEvent Processor is an extension for ArcGIS Server that
  - receives real-time streams from sensors
  - detects interesting patterns with continuous processing & analysis
  - sends results to those who need it where they need it
ArcGIS Server supports Real-Time Processing

GeoEvent Processor integrates and exploits Real-Time data

- GeoEvent Processor is an extension for ArcGIS Server that
  - receives real-time data
  - performs continuous processing & analysis
  - produces alerts and features for those who need it where they need it
Receiving Real-Time Data

Input Connectors

- Users can easily integrate real-time data with ArcGIS by using a Connector that meets their needs.
Receiving Real-Time Data

Input Connectors

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Receiving Real-Time Data

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ArcGIS for Server

GeoEvent Processor

Real-Time Data

- Receive from a Socket
- ws:// Receive from a Web Socket
- Receive on a REST Endpoint
- Receive RSS
- Watch a folder for new Files
- Poll an ArcGIS Server
- http:// Poll an external website
Receiving Real-Time Data

Input Connectors

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Receiving Real-Time Data

Input Connectors

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Performing 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 where the resulting output should be sent.

ArcGIS for Server

Defense Formats

Air Traffic Monitor (GeoEvent Service)

Flight Input

Processor

Convert Altitude from meters to feet

Filter

GEOMETRY inside RestrictedArea/*

Update Flight Feature

Send an email

Web Mobile Desktop
Sending Resulting Streams

Output Connectors

- Users can easily send resulting streams to those who need it where they need it using Connectors.

Real-Time Data

ArcGIS for Server

GeoEvent Processor

Mobile Desktop Web Runtime

Update a Feature

Add a Feature
Sending Resulting Streams

Output Connectors

- Users can easily send resulting streams to those who need it where they need it using Connectors.
Sending Resulting Streams
Output Connectors

- Users can easily send resulting streams to those who need it where they need it using **Connectors**.
Sending Resulting Streams

Output Connectors

- Users can easily send resulting streams to those who need it where they need it using Connectors.

Real-Time Data

ArcGIS for Server

GeoEvent Processor

Mobile Desktop Web Runtime

Send to RabbitMQ
Send to ActiveMQ
Send to HornetQ
Write to Hadoop
Write to MongoDB
Send a Tweet
Send to CESIUM
Send to a Web Socket
Send to a Socket
Write to a File

Update a Feature
Add a Feature
Send an email
Send an Instant Message
Send a Text Message
Publish to REST Endpoint
What does a Connector do?

Connectors are used to create inputs and outputs. It hides the technical details.

- Only relevant details are exposed.
- It might be very specific
  - Get latest earthquakes from [USGS](https://www.usgs.gov)
- Or more general
  - Connect to an RSS feed

New Input
What exactly is a Connector?

A Connector is a recipe that pairs a Transport and an Adapter for a particular purpose.

- **Transport** - moves raw data into the server process
  - The Transport knows HOW to move the data.
- **Adapter** - converts raw data to GeoEvent objects
  - The Adapter knows WHAT the data looks like.

![Diagram showing the relationship between Transport, Adapter, and GeoEvent Service in the ArcGIS GeoEvent Processor](image-url)
What exactly is a Connector?

Example: Receive Text from TCP

- Transport = TCP
- Adapter = Text
What exactly is a Connector?

The connector also specifies the configuration of the Transport and Adapter

- Can have default values
- Can be re-labeled to be more appropriate for the context
- Can be moved under an “advanced” area where users are discouraged from modifying them
- Can be completely hidden from user view (hidden) when the value should never be changed, or when the property is irrelevant
Where do Connectors live

It depends on how you want to view them

- Through the Manager web page
- Through the REST Administration endpoints
Where do Connectors live

Connectors are stored by the GeoEvent Processor, and made available through REST Administration endpoints

- Get a complete list of Connectors:  
  https://localhost:6143/geoevent/admin/connectors/

- Get an individual Connector:  
  https://localhost:6143/geoevent/admin/connector/usgs-earthquakes-input

- Get a Connector in XML:  

- Get a Connector in JSON:  
How to get the exact Connector you want

• Modify existing connectors
• Create completely new connector

*Connectors can only used installed Transport/Adapters*

**Transports**
- Feature Service
- File
- Http
- SMS
- SMTP
- TCP
- UDP
- WebSocket
- XMPP

**Adapters**
- JSON for Features
- Generic JSON
- KML
- RSS
- Delimited Text (CSV)
- Formatted Text (for populating emails)
Custom Connector

Create a custom connector using Web page or REST interfaces

- Built-in form
  Connector editing page
- POST to the REST endpoint
  Local Connectors
When the Built-In Adapters aren’t enough

- Check Online
  - Additional Transports/Adapters will be available from the GeoEvent Processor Resource Center.
  - Once installed, the new component will be available in the Connector Editing forms.
  - If the author of the Adapter knows the typical use cases for the Adapter, he/she can include Connectors with the Adapter. The server will install the new Connectors so that users can immediately create inputs or outputs using the new Adapter.

Install new Component
Are there any restrictions?

- Adapters and Transports are independent. Any Adapter can be paired with any Transport
Custom Adapters & Transports

- If you don’t find what you need on the Resource Center, a custom Transport/Adapter can be built using the samples from the SDK
- Custom Adapters can also install new Connectors
SDK Tour

- API – Javadoc
- Lib – All dependencies rolled into a single JAR file
- Repository – All dependencies packaged as a Maven repository
- Samples – A folder with sample Adapter, Transport, and Processors. Each sample is a Maven project.
Custom Adapter

Create a custom Adapter to convert log file entries to GeoEvents
Continued exploration

- To be notified about when GeoEvent Processor is released: [www.esri.com/geoevent](http://www.esri.com/geoevent)
- Beta Program available now
  - Request beta access by emailing [GeoEventProcessor@esri.com](mailto:GeoEventProcessor@esri.com)
- Next scheduled update is Early Adopters Program in April
- For more information about custom components (Transports/Adapters/Processors) download the SDK and read the Developer’s Guide from the Beta Program website
- Visit our booth in the Expo Hall or visit our “Meet the team” area tonight
- Ryan Elliott  [relliott@esri.com](mailto:relliott@esri.com)
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Excellent

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