ArcGIS® GeoEvent Server

Introduction Tutorial

Lesson 5 – Advanced Processors

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The Real-Time Visualization & Analytics Team strives to update product tutorials and abstracts to reflect the latest release. Depending on the version of ArcGIS GeoEvent Server you are using, there may be inconsistencies between your environment and the illustrations or specific steps in exercises or videos bundled with the abstract. The concepts outlined, however, should be applicable across different versions of GeoEvent Server.

Contents

Tutorial overview

The Introduction to ArcGIS GeoEvent Server Tutorial is one of several tutorials that introduces you to the capabilities of ArcGIS GeoEvent Server. The tutorial contains six lessons, each complementing one another by exploring different capabilities. If you are new to GeoEvent Server, you are encouraged to start with Lesson 1 and then work through the remaining lessons. If you are familiar with GeoEvent Server, you can skip to any other lesson depending on your learning objectives, you do not need to complete each lesson in order. Later lessons will assume you have some familiarity with GeoEvent Server.

The lessons include a GeoEvent Server product configuration that you will import. Each includes configured items such as inputs, outputs, GeoEvent Definitions, and GeoEvent Services that support the lesson. Carefully review the information on what is included in the configuration, as it may reset items you created as part of previous lessons and product exploration.

This tutorial does not provide information on installing, deploying, or managing ArcGIS GeoEvent Server. For information about deploying ArcGIS GeoEvent Server, see Deployment considerations.

Access the other lessons here. If you have questions, comments, or feedback on this tutorial, start a discussion on the ArcGIS GeoEvent Server Community.

Tutorial prerequisites

Before getting started with the Introduction to GeoEvent Server Tutorial, review the following prerequisites.

- ArcGIS GeoEvent Server is installed, licensed, and configured in your organization. If not, see the following topics for your operating system to install GeoEvent Server:
    - GeoEvent Server (Windows) installation guide
    - GeoEvent Server (Linux) installation guide
- A managed relational geodatabase or ArcGIS Data Store is registered to ArcGIS Server. See Register an ArcGIS Server managed database for more information.
- ArcGIS Server must be licensed with the ArcGIS GIS Server and ArcGIS GeoEvent Server licensing roles.
- Exercises in this tutorial assume GeoEvent Server is installed on a single machine with ArcGIS Server. The exercises will leverage the **Default** connection to ArcGIS Server, accessible in **GeoEvent Manager** by navigating to **Site** > **GeoEvent** > **Data Stores**.

Lesson 5 overview

Lesson 5 builds upon the concepts of event data processing presented in Lesson 4. Exercises in this lesson will introduce the Incident Detector Processor, the GeoTagger Processor, and the Track Gap Detector Processor – more advanced processors enabling event monitoring and enrichment based on spatial proximity.

Once you have completed the exercises in this lesson, you should be able to explain the purpose of the processors listed below and how they are used:

- **Incident Detector Processor** – Monitor incidents based on the spatial proximity and changing attributes of events as they are received, in real-time, for an area of interest defined by a geofence.
- **GeoTagger Processor** – Enrich events with properties retrieved from a geofence based on the spatial proximity of the event's Geometry to the area of interest defined by the geofence.
- **Track Gap Detector Processor** – Monitor an event feed to detect the absence of expected data for an asset being tracked.

Lesson 5 prerequisites

The prerequisite steps below must be completed before proceeding with the exercises in this lesson.

Prerequisite 1: Create a folder on the GeoEvent Server machine

To complete Lesson 5, you will create a new folder on the GeoEvent Server machine. This folder will be used with the file-based outputs in GeoEvent Server. If you already created the folder structure in previous lessons, proceed to the next prerequisite.

1. On the GeoEvent Server machine, create the folder structure below:

   `C:\GeoEvent\output`

Prerequisite 2: Import a GeoEvent Server configuration

ArcGIS GeoEvent Server stores elements and settings in a configuration file (.xml). To complete this lesson, a GeoEvent Server configuration file is included to help get your GeoEvent Server environment configured with the required elements to complete the exercises below. For more information about working with GeoEvent Server configurations, see Manage configurations.

To complete this lesson, a GeoEvent Server configuration file is included to help you get your GeoEvent Server environment configured with the necessary elements to complete the exercises below.

The GeoEvent Server configuration for this lesson includes the following items:

GeoEvent Definition	Vehicles
Input	vehicles-tcp-text-in

Outputs	geotagger-file-out trackgap-file-out
Geofences	OperationalArea/Zone1 Counties ZipCodes

NOTE: *If an element with the specified name above already exists in your environment, importing this configuration will overwrite those elements. You will reset your GeoEvent Server configuration which will remove items you created previously and import only the items necessary for this Lesson.*

Follow the steps below to reset and import the GeoEvent Server configuration for Lesson 5.

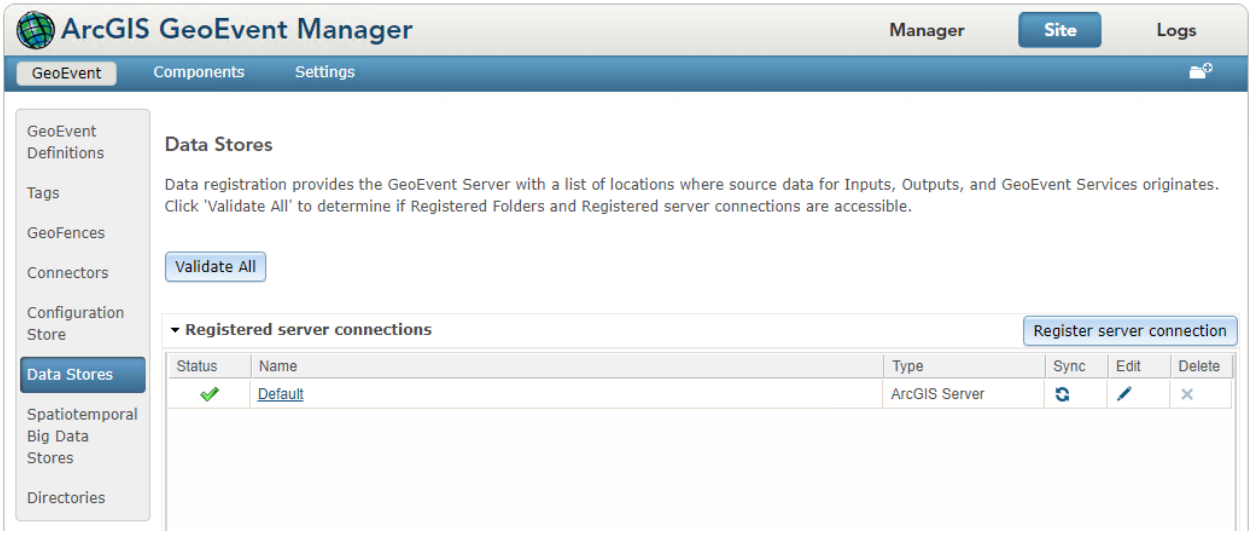
1. Open **ArcGIS GeoEvent Manager** and navigate to **Site** > **GeoEvent** > **Configuration Store**.
2. Click **Reset Configuration** and click **Yes** to confirm.

   NOTE: *If you have anything else configured in your GeoEvent Server environment, resetting the configuration will delete everything from your configuration.*
3. Click **Import Configuration**.
4. Click **Choose File** and browse to the …`\configuration` folder included with this lesson and select the **Lesson_5.xml** file and click **Open** and then **Next**.
5. Click **Next**, ensure **Import Configuration** is selected, and click **Import** to import the configuration.

   NOTE: *It is best practice to stop any inputs, outputs, and GeoEvent Services before exporting a GeoEvent Server configuration. When imported, a started element may begin processing event data before you are ready for it to do so, contend with another running element, or import in an error state when an externally hosted socket connection, for example, is not yet available for a client connection.*
6. Navigate to the **Manager** page and click ▶ to start the **vehicles-tcp-text-in** input.

Prerequisite 3: Register a server connection

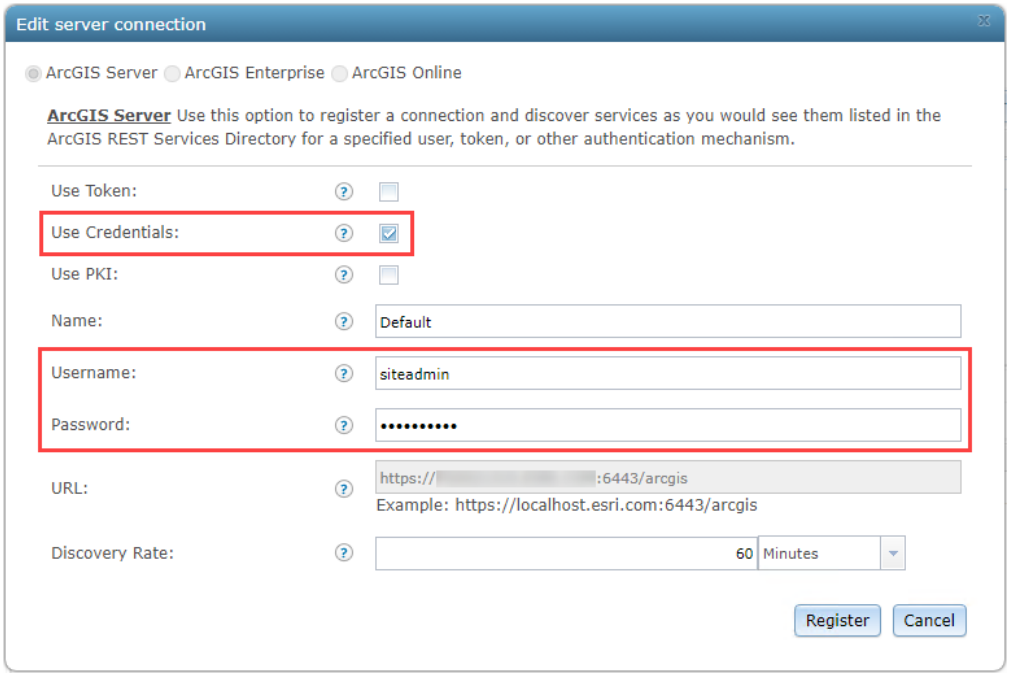
In **GeoEvent Manager**, you can access and register data stores for use in GeoEvent Server. When GeoEvent Server is installed, a **Default** registered data store connection is available that connects to the ArcGIS Server running on the local server.



Exercises in this tutorial assume GeoEvent Server is installed and licensed on a single ArcGIS Server machine. This lesson leverages the **Default** connection to ArcGIS Server. For more information on working with data stores in GeoEvent Server, see Manage data stores.

You will edit the existing default connection with credentials to your ArcGIS Server site. This is required to complete this lesson.

1. In **GeoEvent Manager**, navigate to **Site** > **GeoEvent** > **Data Stores**.
2. Click to edit the **Default** registered server connection.
3. Check the **Use Credentials** checkbox and type your primary site administrator username and password for your ArcGIS Server.



NOTE: *If your GeoEvent Server site is federated with Portal, the Default connection will be an ArcGIS Enterprise connection. You will need to enter credentials of an account that has at least publishing capabilities in your ArcGIS Enterprise portal.*

4. Click **Register** to save the data store connection.

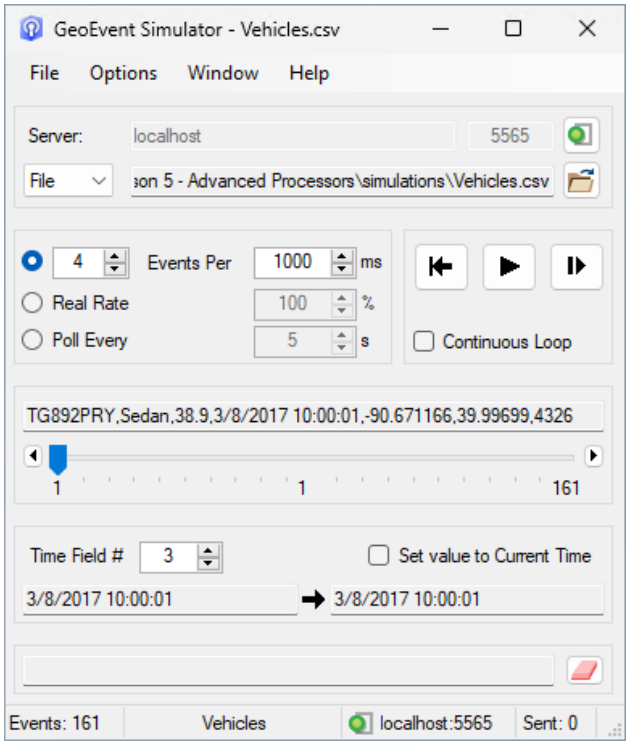
If the updates were successful, a green checkmark will appear next to the **Default** connection.

Prerequisite 4: Simulate real-time data

You will simulate real-time event data to GeoEvent Server using GeoEvent Simulator.

1. Open **GeoEvent Simulator** from the Windows **Start** menu or use the **GeoEventSimulator.exe** at: `<ArcGIS Server installation directory>\GeoEvent`.
2. Click  to connect to the TCP input over the default TCP port **5565**.

   The button changes to  indicating you are connected to the input.
3. Click  , then click  again on the next dialog and browse to the `…\simulations` folder included with this tutorial.
4. Select **Vehicles.csv** file and click **Open**.
5. Leave the default values for the **Event Separator** and **Field Separator** parameters.
6. For **Time Field #**, select **3**.
7. Click **Load** to load the file's data into GeoEvent Simulator.
8. Uncheck the **Continuous Loop** checkbox.
9. Set the simulator to 4 **Events Per** `1000` **ms**.



NOTE: *Do not start the simulation until instructed to do so in the exercises.*

Prerequisite 5: Add stream service outputs

Next, you will create a new Send Features to a Stream Service Output Connector that will send event data to a stream service.

1. In **GeoEvent Manager**, on the **Manager** page, click **Add Output**.
2. Under the **Stream Service** category, select the **Send Features to a Stream Service** output.
3. Specify the parameters as follows:
   a. For **Name**, type `vehicles-stream-service-out`.

b. For **Registered server connection**, select **Default.**

c. For **Folder**, select **Root**.

NOTE: *Stream services can only be published to the root directory of ArcGIS Server.*

d. Click **Publish Stream Service** and set the parameters as follows:

NOTE: *If the button is grayed out, see Prerequisite 3 above. The ArcGIS Server machine that GeoEvent Server is installed on must have a GIS Server license role applied. For more on licensing roles, see [ArcGIS Server licensing roles](#).*

i. For **Name**, type `vehicles_stream`.

ii. For **GeoEvent Definition**, select **Vehicles**.

iii. Leave all the other parameters set to their default values.

e. Click **Publish**.

4. Click **Save** to save the output.

5. Create another stream service output with the following parameters:

a. For **Name**, type `speeding-incidents-stream-service-out`.

b. For **Registered server connection**, select **Default.**

c. For **Folder**, select **Root**.

d. Click **Publish Stream Service** and set the parameters as follows:

i. For **Name**, type `speeding_incidents_stream`.

ii. For **GeoEvent Definition**, select **incident**.

iii. Leave all the other parameters set to their default values.

e. Click **Publish**.

6. Click **Save** to save the second output.

7. Create another stream service output with the following parameters:

a. For **Name**, type `boundary-incidents-stream-service-out`.

b. For **Registered server connection**, select **Default.**

c. For **Folder**, select **Root**.

d. Click **Publish Stream Service** and set the parameters as follows:

i. For **Name**, type `boundary_incidents_stream`.

ii. For **GeoEvent Definition**, choose **incident**.

iii. Leave all the other parameters set to their default values.

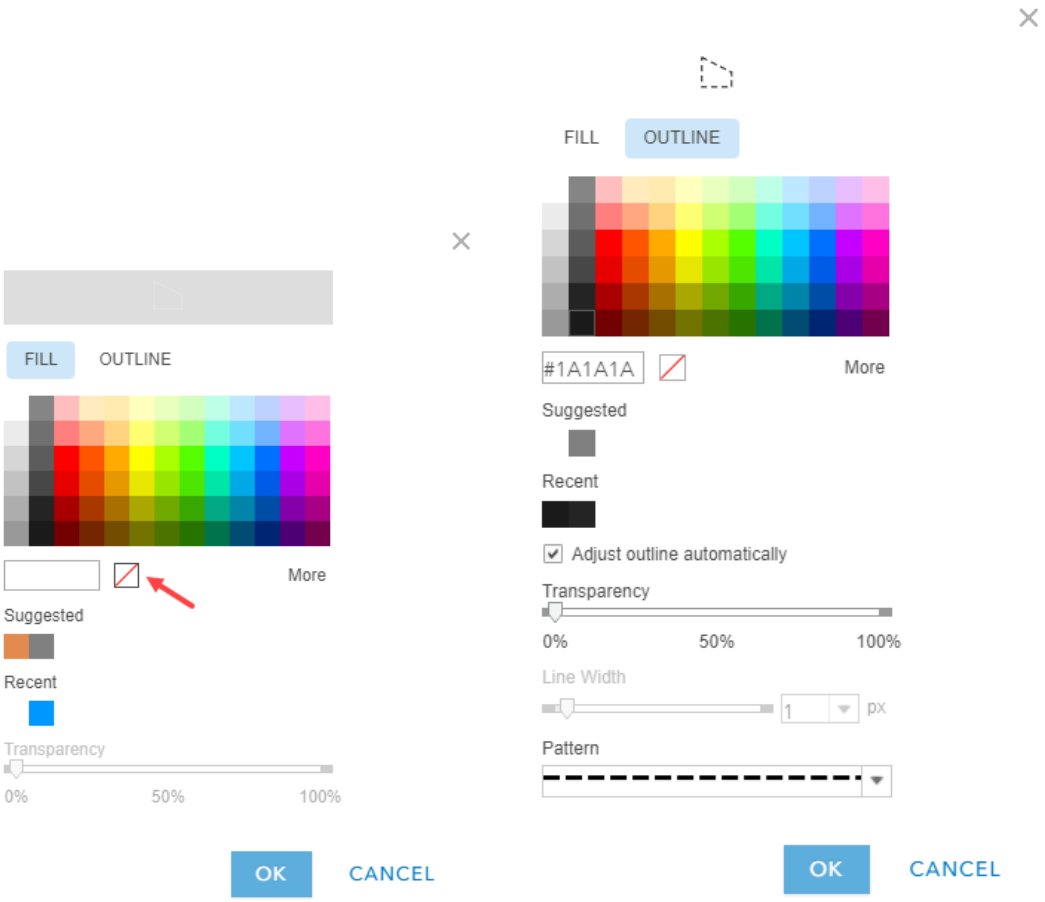
e. Click **Publish**.

8. Click **Save** to save the third output.
9. From the **Manager** page, click ▶ to start the **vehicles-stream-service-out**, **speeding-incidents-stream-service-out**, and **boundary-incidents-stream-service-out** outputs.
10. Click **Add Service** to add a new GeoEvent Service.
11. For **Service Name**, type `vehicles` and click **Create**.
12. From **Inputs**, drag-and-drop the **vehicles-tcp-text-in** input into the service designer.
13. From **Outputs**, drag-and-drop the **vehicles-stream-service-out** output into the service designer.
14. Configure the GeoEvent Service as illustrated below:

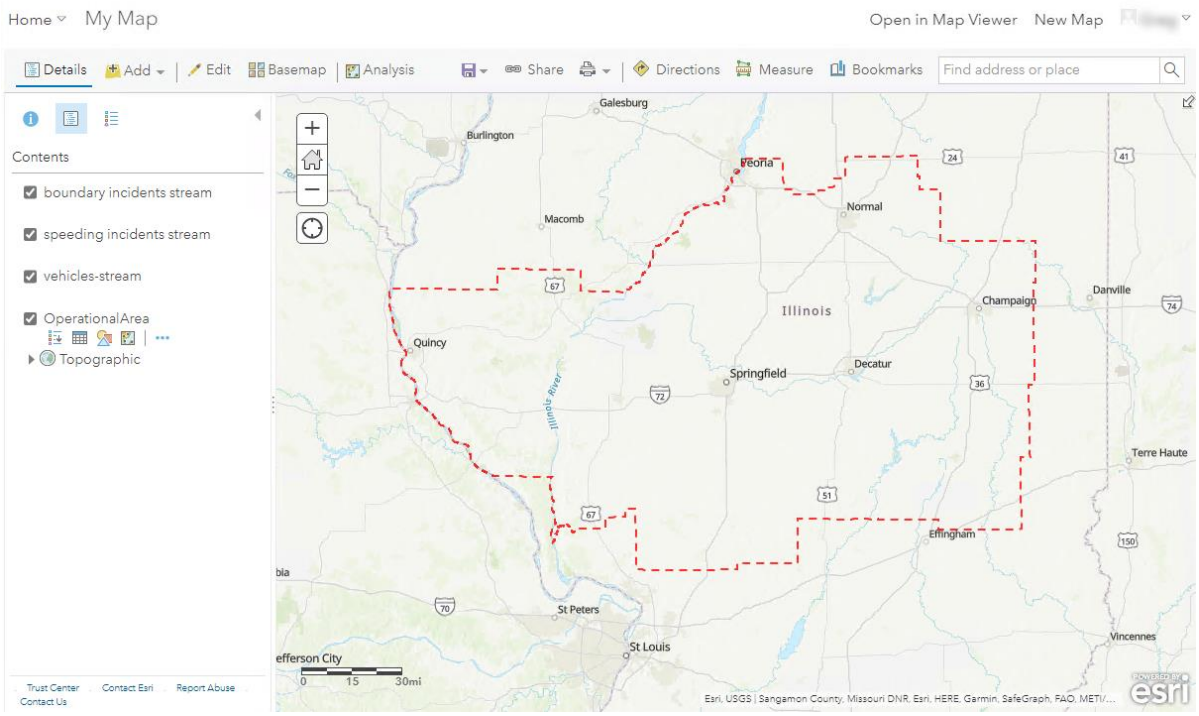
15. Click **Publish** to publish the GeoEvent Service.
16. Click **Back** to exit the service designer.

Prerequisite 6: Prepare a web map

1. In a browser, open your ArcGIS Enterprise portal or ArcGIS Online.
2. If using ArcGIS Enterprise, sign into your Portal account. If using ArcGIS Online, sign in to your ArcGIS account.
3. On the ribbon, click the **Map** tab.
4. On the ribbon, click **Open in Map Viewer Classic**.
5. Click **Add** and select **Add Layer from File**.
6. Click **Choose File** and browse to the **OperationalArea.geojson** file in the …`\data` folder included with this lesson and click **Open**.
7. Click **IMPORT LAYER**.
8. In the left pane, select **Location (Single symbol)** and click **Options**.
9. Click **Symbols**.
10. Match the symbology for **Fill** and **Outline** as illustrated below:

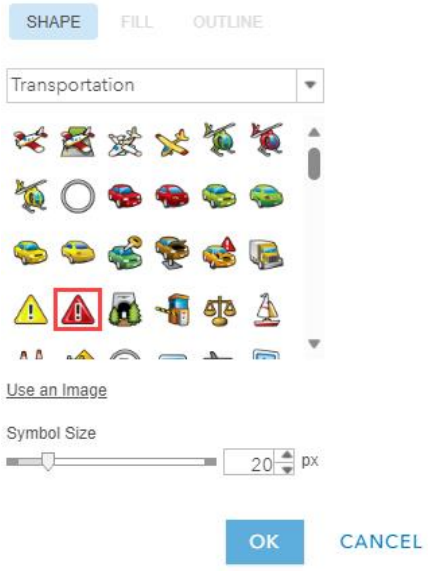


11. Click **OK**, then **OK**, then **DONE** to save the symbology.
12. In another browser tab, navigate the ArcGIS Server REST Services Directory endpoint that the stream service is published (typically, at `https://gisserver.domain.com:6443/arcgis/rest`).
13. Click **Login** and sign in if you are not already.
14. In the **root** folder, click the **vehicles_stream** stream service.
15. In the browser address bar, copy the URL (for example, `https://gisserver.domain.com:6443/arcgis/rest/services/vehicles_stream/StreamServer`).
16. In the **Map Viewer Classic**, click **Add** and choose **Add Layer from Web**.
17. Paste the URL you copied above in the **URL** parameter and click **ADD LAYER**.
18. Repeat steps 14-17 for the **speeding_incidents_stream** and **boundary_incidents_stream** stream services.



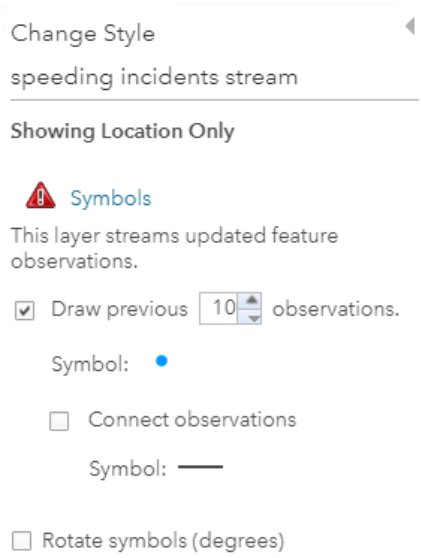
NOTE: *If your server is secured or is federated with ArcGIS Enterprise portal, you may be prompted to enter your credentials.*

19. In the **Contents**, hover over the **speeding_incidents_stream** layer and click  to change the style.
20. Click **Symbols**, from the drop-down menu select **Transportation**.
21. Choose the highlighted symbol and set the symbol size to **20** as illustrated below.

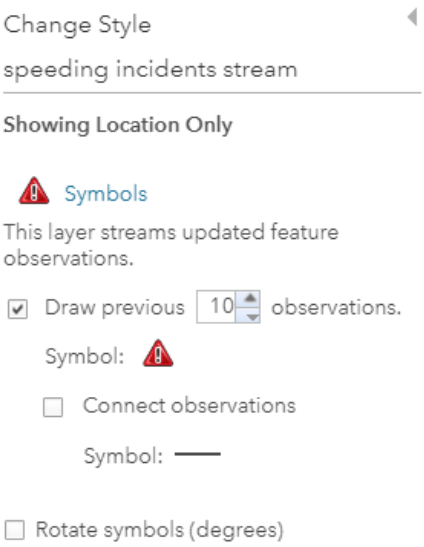


22. Click **OK**.

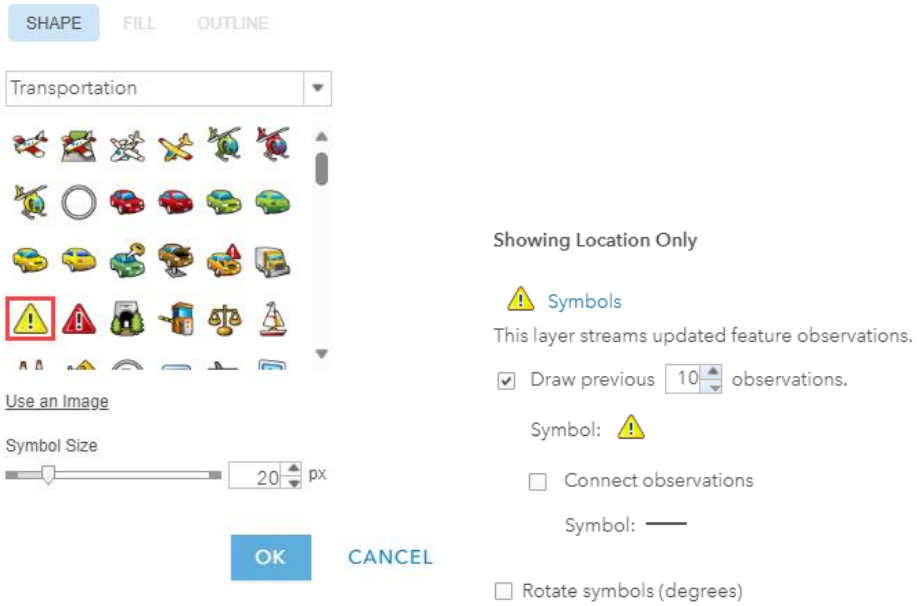
23. Check the **Draw previous observations** checkbox and type 10.



24. Click the symbol next to **Symbol** and select the same symbol and size as Step 21 above.



25. Click **OK**, then **OK** again to save the symbol style.
26. Repeat Steps 19-25 for the **boundary_incidents_stream** layer and select the highlighted symbol and symbol size as illustrated below:



27. Click **OK**, and then **OK** again to save the symbol style.

You have successfully completed the prerequisite steps to complete the exercises in this lesson. Keep this map open in the browser tab.

Lesson 5 exercises

Processors are another type of element you can add to a GeoEvent Service that can process, enrich, restructure, and calculate new data values associated with event records before they are sent to other processors and outputs.

In the exercises in this lesson, you will be explore three advanced processors including the Incident Detector Processor, GeoTagger Processor, and the Track Gap Detector Processor. You will use these processors to perform more advanced processing and analysis of a fleet of vehicles, in real-time.

Exercise 1a: Incident Detector Processor

The Incident Detector Processor uses specified opening and closing conditions to detect incidents and monitor their status as the incident unfolds, all in real-time. The processor can either periodically report while an incident is active or just report when an incident is detected, when its closing condition is met, and at the same time report the incident's duration.

You will configure an Incident Detector Processor with an attribute expression that will open an incident when a vehicle's speed exceeds a specified rate of speed. Later, you will reconfigure the processor to detect when a vehicle has exited an area of interest, represented by a geofence.

1. Open **ArcGIS GeoEvent Manager**, on the **Manager** page click **Add Service**.
2. For **Service Name**, type `Incident Detector` and click **Create**.

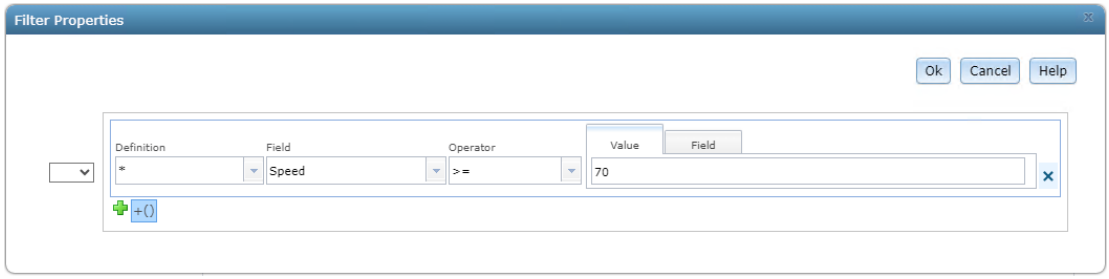
3. From the **New Elements** menu, double-click **Processor** to add a new processor and specify the parameters as follows:

    a. For **Name**, type `Vehicle Speeding`.

    b. For **Processor**, select **Incident Detector**.

    c. For **Incident Name**, type `Vehicle Speeding`.

    d. Click **Opening Condition** and click  to add a new expression and specify the expression parameters illustrated below.



    e. Click **OK** to save the expression.

    The new expression now appears in the **Opening Condition** parameter. Notice that it is optional to create a **Closing Condition**. When a closing condition is not specified, as is the case in this exercise, the logical negation of the opening condition is the assumed default closing condition. So, in this use case, when the speed of a vehicle goes below 70 mph, the incident closes.

    f. For **Severity**, select **Warning**.

    g. For **Incident Type**, select **Point in Time**.

    h. For **Geometry Type**, select **Point**.

    i. For **Expiry Time (seconds)**, type `300`.

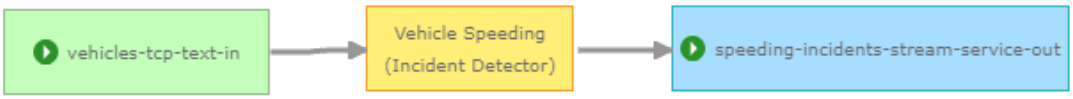
    j. For **Keep Source Fields**, select **No**.

4. Click **OK** to add the processor.

5. Under **Inputs**, drag-and-drop the **vehicles-tcp-text-in** input into the service designer.

6. Under **Outputs**, drag-and-drop the **speeding-incidents-stream-service-out** output into the service designer.

7. Configure the GeoEvent Service as illustrated below:

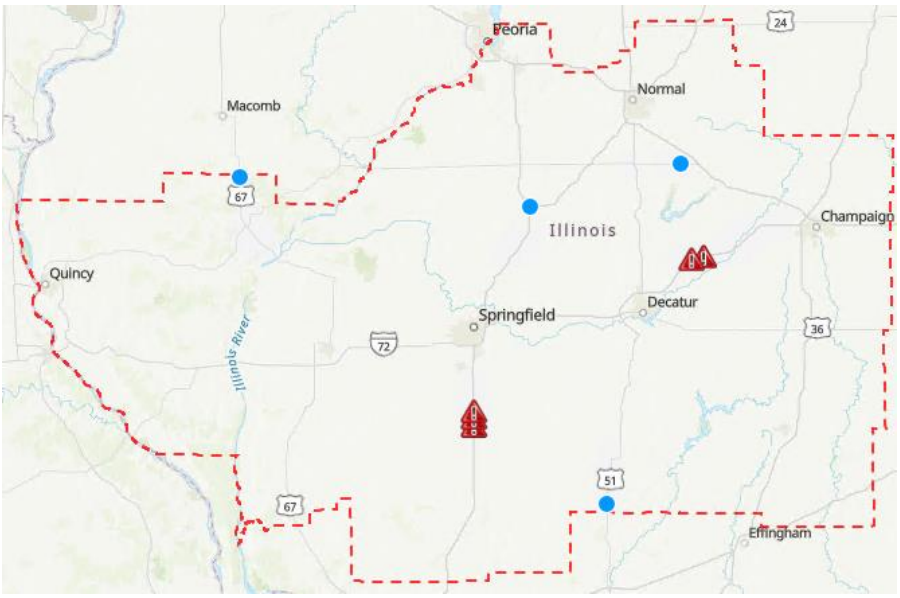


8. Click **Publish** to publish the GeoEvent Service.

9. Open the browser tab with the web map you configured in the prerequisite steps.

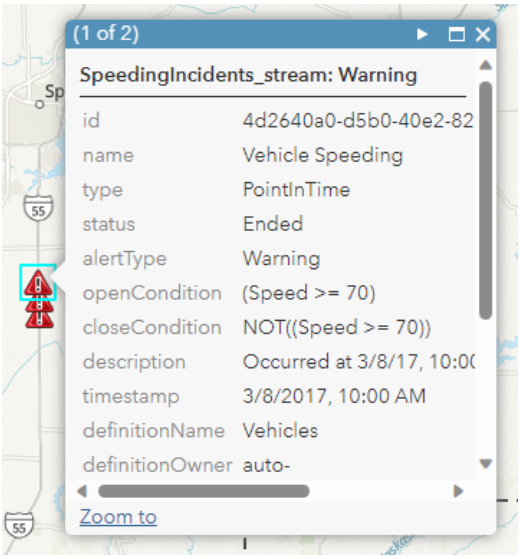
10. In **GeoEvent Simulator**, click ▶ to start the simulation.

    In the web map, several incident features should appear on the map, indicating a vehicle was speeding in those locations.



11. Click one of the incidents and review the attributes.

    Important information is captured by the processor such as the name of the incident and the time it occurred.



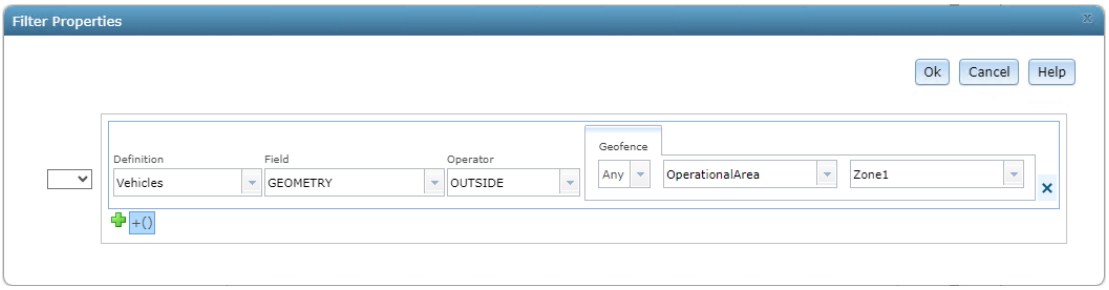
Exercise 1b: Incident Detector Processor

In this exercise, you will create another Incident Detector Processor to detect when a vehicle has left an operational area that is defined by a geofence. Unlike the previous exercise in which the processor

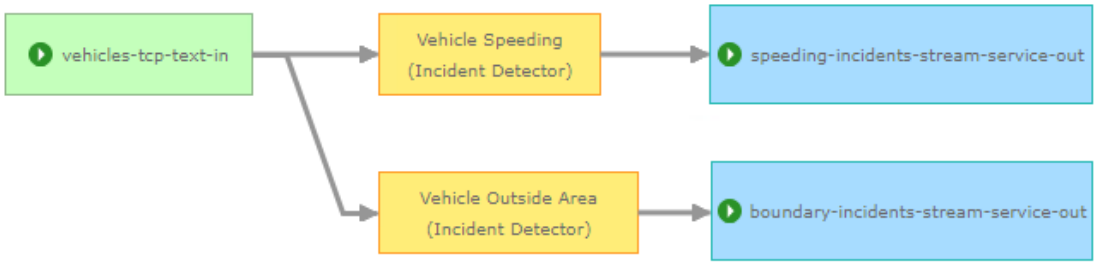
created *Point in Time* incidents, you will now configure the processor to create *Cumulative* incidents which can track the duration of the incidents.

The **OperationalArea/Zone1** geofence was included in the configuration file you imported in the prerequisites above. For information about creating geofences, refer to the *Filter based on spatial conditions* exercise in Lesson 3 and the Manage geofences help topic.

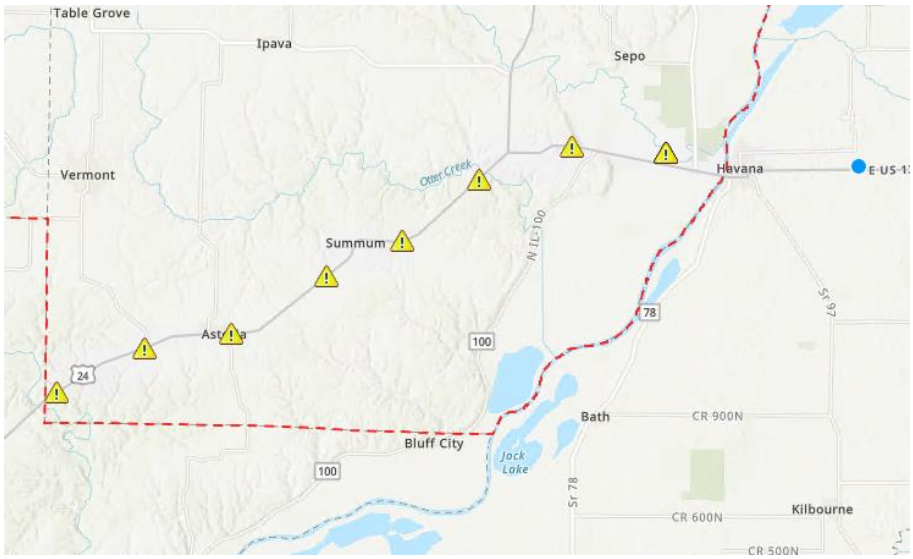
1. In **GeoEvent Manager**, on the **Manager** page, open the **Incident Detector** GeoEvent Service.
2. From the **New Elements** menu, double-click **Processor** and specify the parameters as follows:
    a. For **Name**, type `Vehicle Outside Area`.
    b. For **Processor**, select **Incident Detector**.
    c. For **Incident Name**, type `Vehicle Outside Operational Area`.
    d. Click **Opening Condition** and click ✚ to add a new expression and specify the expression parameters illustrated below.



    e. Click **OK** to save the expression.
    f. For **Severity**, select **Warning**.
    g. For **Incident Type**, select **Cumulative**.
    h. For **Geometry Type**, select **Point**.
    i. For **Expiry Time (seconds)**, type `300`.
    j. For **Keep Source Fields**, select **No**.
3. Click **OK** to save the processor.
4. From **Outputs**, drag-and-drop the **boundary-incidents-stream-service-out** output into the service designer.
5. Configure the GeoEvent Service as illustrated below:

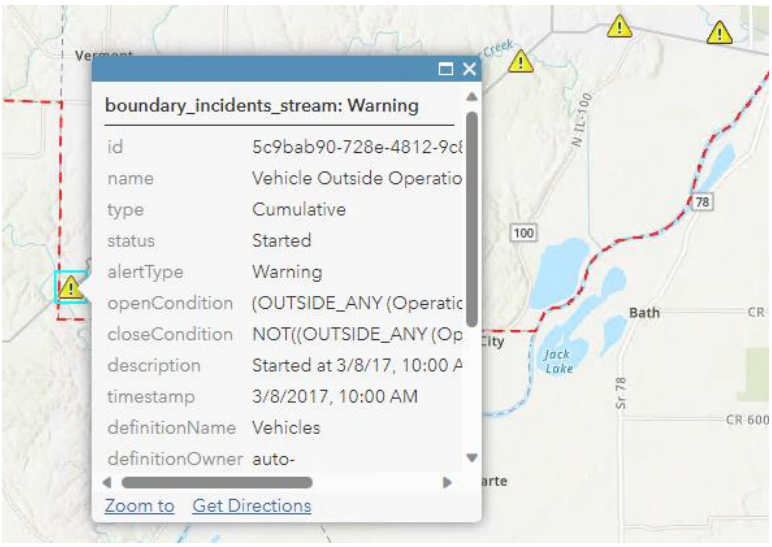


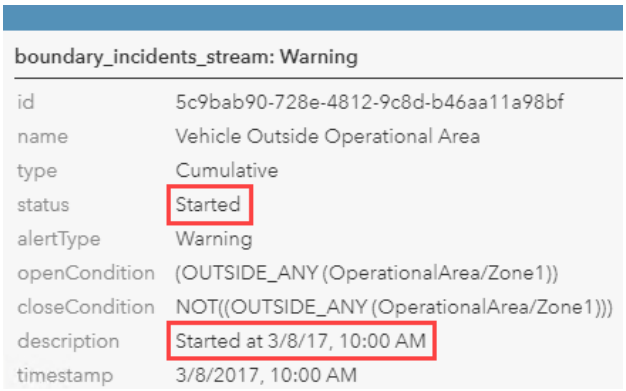
6. Click **Publish** to publish the GeoEvent Service.
7. Open the web map you configured previously.
8. In **GeoEvent Simulator**, click ⏮ to start the simulation from the beginning.
9. Click ▶ to start the simulation and observe the web map.



Notice that several incidents were created when a vehicle traveled outside of the Operational Area geofence. If the incidents are not displayed yet, wait a few seconds for the vehicle to leave the Operational Area. The incident closes when the vehicle enters the Operational Area geofence again.

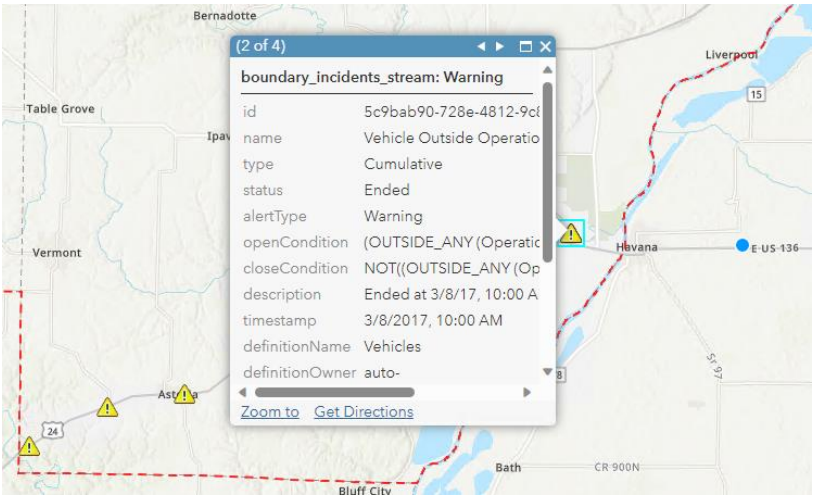
10. Click the first incident when the vehicle left the Operational Area and review the attributes.

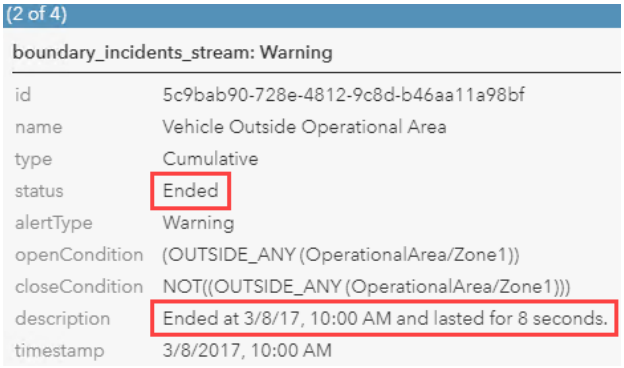




Note that the incidents **status** shows as **Started**, incidating the vehicle traveled outside the Operational Area at the specific date and time.

11. Click the last incident before the vehicle reenters the Operational Area. Note that you will need to click ▶ in the window to see the **Ended** incident.





Notice that the incident **status** shows as **Ended**, incidating the vehicle reentered the Operational Area at the specific date and time and shows the duration the vehicle was outside the Operational Area.

In this exercise, you sent incidents to a stream service to visualize those incidents in a web map. It is important to note that in most production scenarios, you would likely not use a stream service for incident alerting purposes since storing and archiving this data for further analysis could be an important requirement. There are several output connectors in GeoEvent Server that allow you to store and archive data such as writing it to a file, feature service, and spatiotemporal big data store. As an example, you could use the Write to a CSV File output to write the incident data to a CSV file as illustrated below.

I	J
Started at 11/30/23, 11:24 AM	2023-11-30T11:24:21.097-08:00
Ongoing for last 1 seconds.	2023-11-30T11:24:22.097-08:00
Ongoing for last 2 seconds.	2023-11-30T11:24:23.098-08:00
Ongoing for last 3 seconds.	2023-11-30T11:24:24.101-08:00
Ongoing for last 4 seconds.	2023-11-30T11:24:25.097-08:00
Ongoing for last 5 seconds.	2023-11-30T11:24:26.098-08:00
Ongoing for last 6 seconds.	2023-11-30T11:24:27.099-08:00
Ongoing for last 6 seconds.	2023-11-30T11:24:27.099-08:00
Ended at 11/30/23, 11:24 AM and lasted for 7 seconds.	2023-11-30T11:24:27.099-08:00

You have successfully configured an Incident Detector Processor to detect incidents and alert when a vehicle speeds as well as exits an Operational Area geofence.

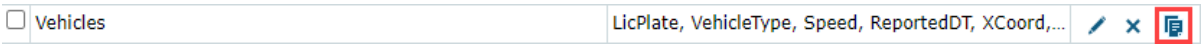
Exercise 2: GeoTagger Processor

You will now explore the GeoTagger Processor that provides a specialized combination of event proximity detection and enrichment, enabling event data to be tagged with attributes from a geofence. You will use the GeoTagger Processor to tag vehicles with the ZIP code and county in which they are travelling.

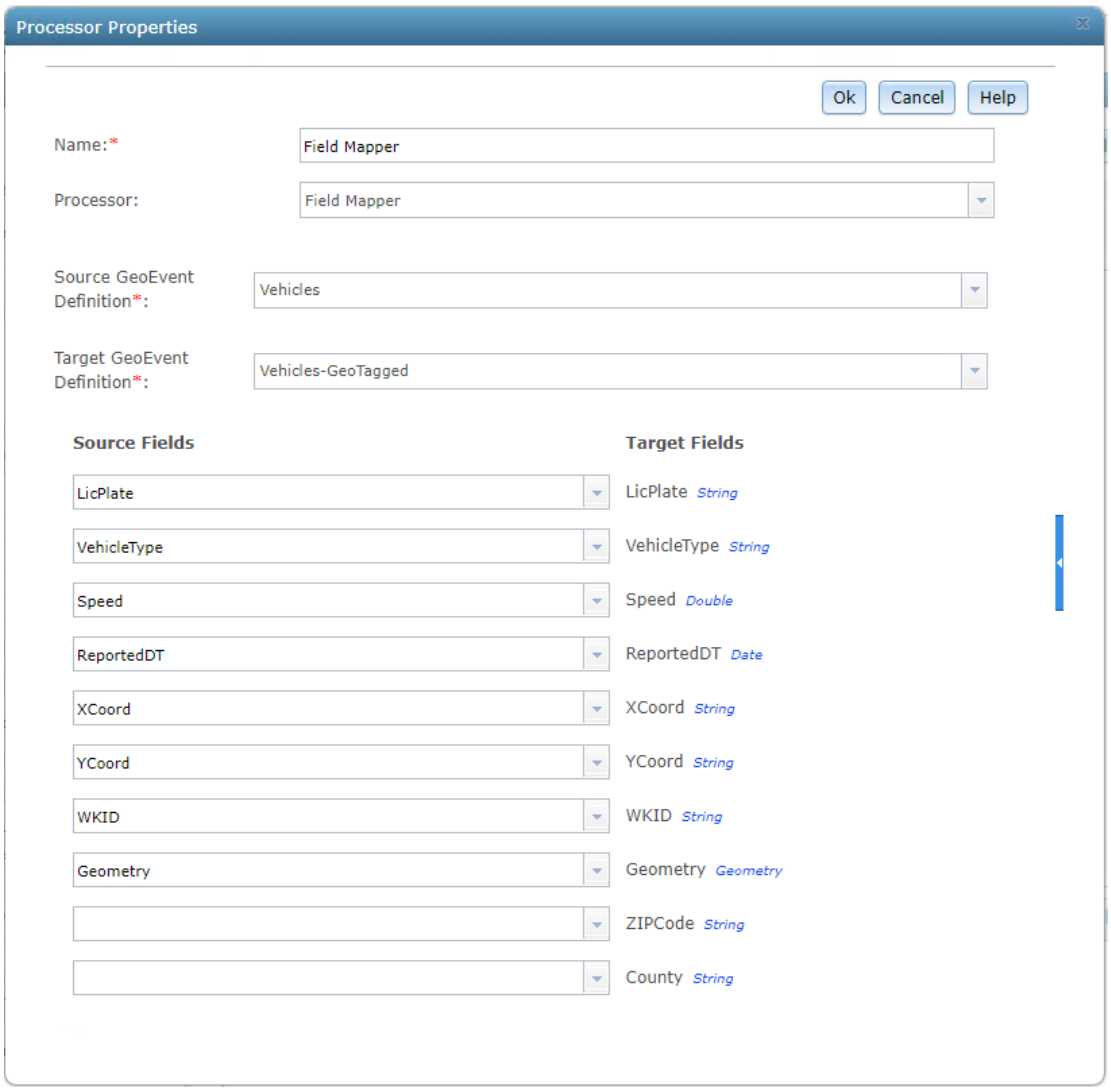
The **Counties** and **ZipCodes** geofences were included in the configuration file you imported in the prerequisites above. For information about creating geofences, refer to the *Filter based on spatial conditions* exercise in Lesson 3 and the Manage geofences help topic.

Before you get started, it is important to understand that the GeoTagger Processor appends data to incoming event records. This appended data can either be added to existing or new fields, meaning the processor can create a new GeoEvent Definition or use an existing one. For this exercise, you will create a copy of the **Vehicles** GeoEvent Definition and add two additional fields to it, specifically `ZipCode` and `County`.

1. In **GeoEvent Manager**, navigate to **Site** > **GeoEvent** > **GeoEvent Definitions**.
2. Click  to create a copy of the **Vehicles** GeoEvent Definition.



3. For **GeoEvent Definition Name**, type `Vehicles-GeoTagged`.
4. Click **New Field** and specify the parameters as follows:
    a. For **Field Name**, type `ZIPCode`.
    b. For **Type**, select **String**.
    c. For **Cardinality**, select **One**.
5. Click **Create** to add the new field.
6. Repeat step 4 and 5 to create another new field with the following parameters:
    a. For **Field Name**, type `County`.
    b. For **Type**, select **String**.
    c. For **Cardinality**, select **One**.
7. Click **Save** to save the new GeoEvent Definition.
8. Navigate to the **Manager** page and click **Add Service**.
9. For **Name**, type `GeoTagger` and click **Create**.
10. From the **New Elements** menu, double-click **Processor** and specify the parameters as follows:
    a. For **Name**, type `Field Mapper`.
    b. For **Processor**, select **Field Mapper**.
    c. For **Source GeoEvent Definition**, select **Vehicles**.
    d. For **Target GeoEvent Definition**, select **Vehicles-GeoTagged**.
11. Under **Source Fields**, select the fields illustrated below:



There are two fields in the source **Vehicles** GeoEvent Definition that will be mapped to the `ZipCode` and `County` fields from the target **Vehicles-GeoTagged** GeoEvent Definition. This will allow the GeoTagger Processor to append records into these mapped fields.

12. Click **OK** to add the new processor.

You will now add and configure the GeoTagger Processor that will tag incoming vehicle event records with the ZIP code they are located in.

13. From the **New Elements** menu, double-click **Processor** and specify the parameters as follows:

    a. For **Name**, type `ZIPCode`.

    b. For **Processor**, select **GeoTagger**.

    c. For **Geofence(s)**, type `ZipCodes/.*`

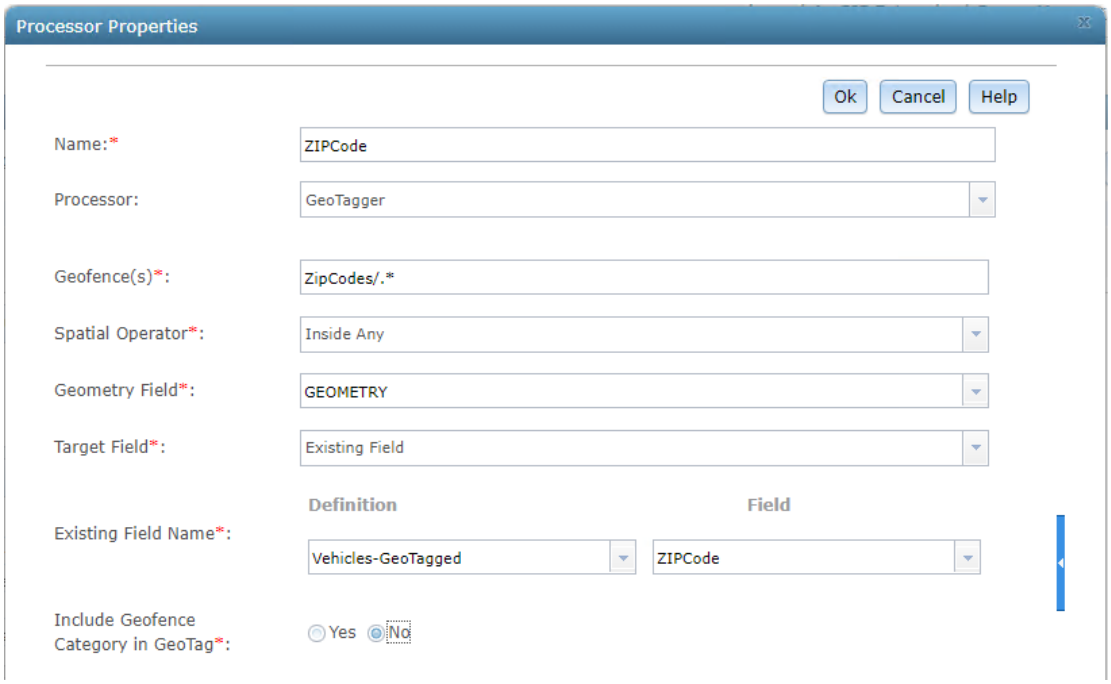
    d. For **Spatial Operator**, select **Inside Any**.

e. For **Geometry Field**, select **GEOMETRY**.

f. For **Target Field**, select **Existing Field**.

g. For **Existing Field Name**, select **Vehicles-GeoTagged** for **Definition**, and **ZIPCode** for **Field**.

h. For **Include Geofence Category in GeoTag**, select **No**.



14. Click **OK** to add the new processor.

You will now configure another GeoTagger Processor that will tag incoming vehicle event records with the county they are located in.

15. From **New Elements**, double-click **Processor** and specify the parameters as follows:

a. For **Name**, type `County`.

b. For **Processor**, select **GeoTagger**.

c. For **Geofence(s)**, type `Counties/.*`

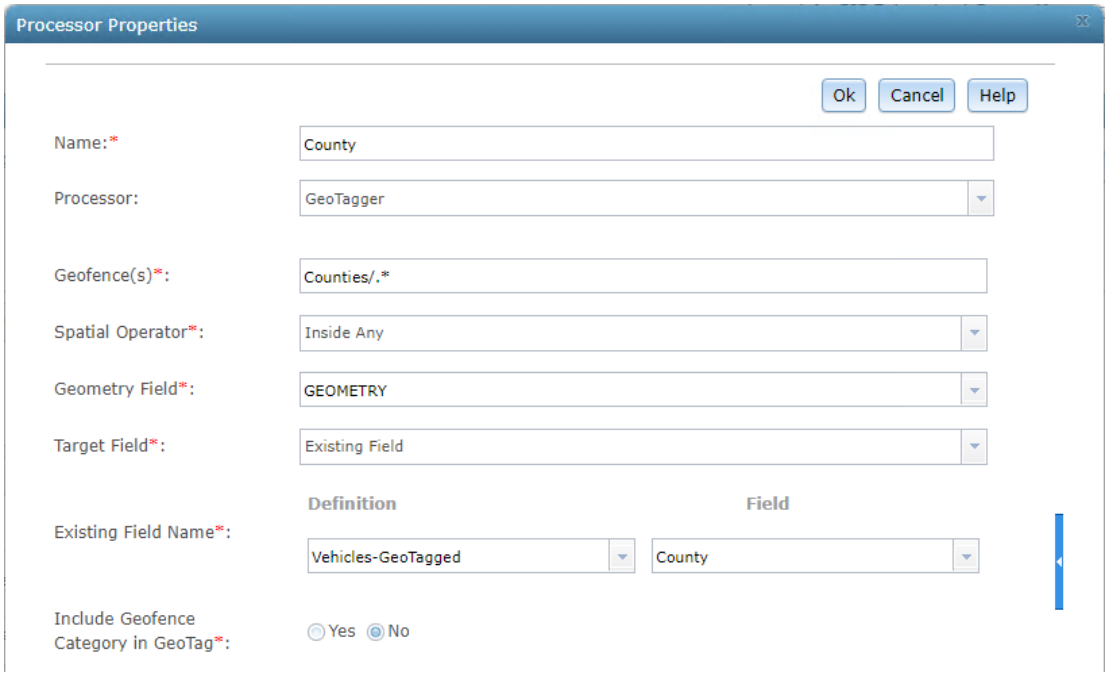
d. For **Spatial Operator**, select **Inside Any**.

e. For **Geometry Field**, select **GEOMETRY**.

f. For **Target Field**, select **Existing Field**.

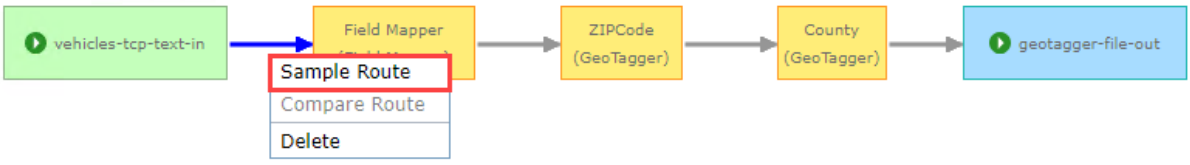
g. For **Existing Field Name**, select **Vehicles-GeoTagged** for **Definition**, and **County** for **Field**.

h. For **Include Geofence Category in GeoTag**, select **No**.

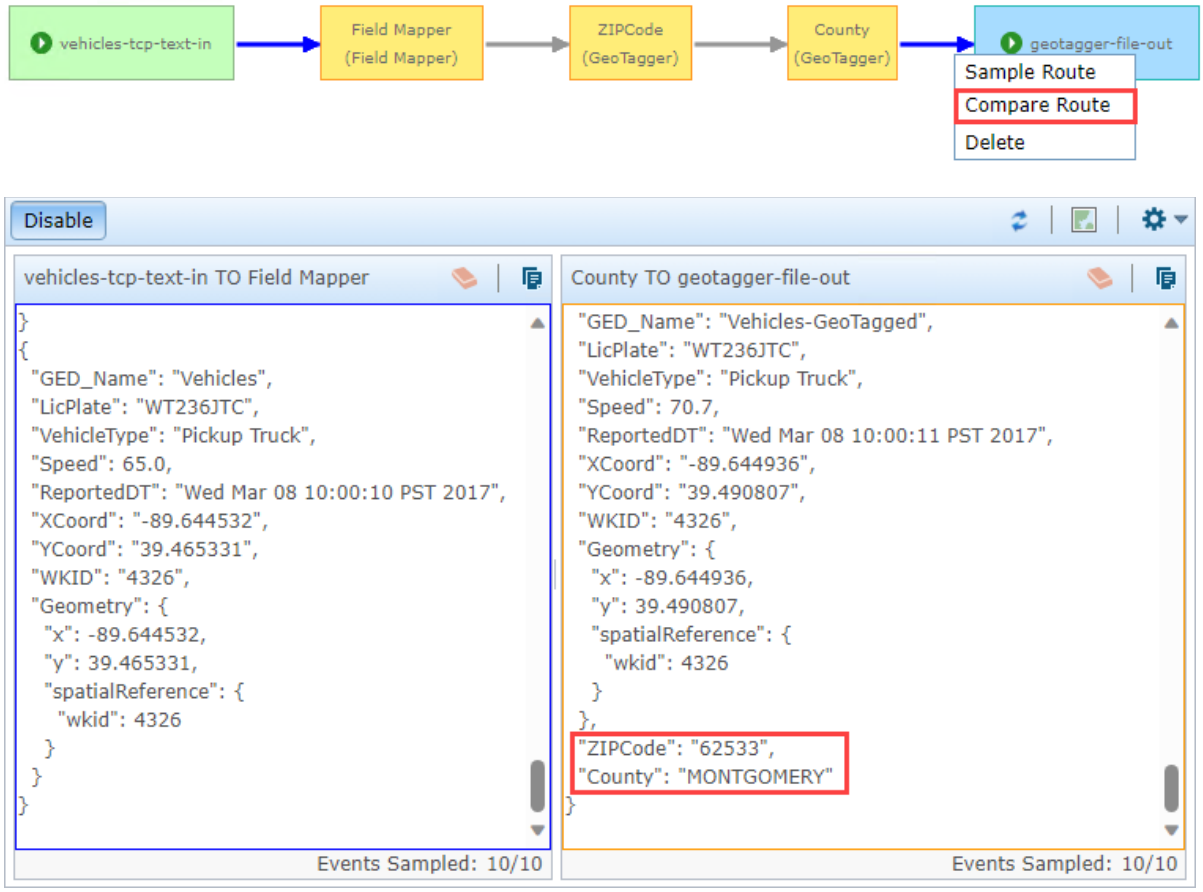


16. Click **OK** to add the new processor.
17. From **Inputs**, drag-and-drop the **vehicles-tcp-text-in** input into the service designer.
18. From **Outputs**, drag-and-drop the **geotagger-file-out** output into the service designer and start the output.
19. Configure the GeoEvent Service as illustrated below.

20. Click **Publish** to publish the GeoEvent service.
21. In **GeoEvent Simulator**, click  to start the simulation from the beginning.
22. Check the **Continuous Loop** checkbox.
23. Click  to start the simulation.
24. In **GeoEvent Manager**, right-click the highlighted route below and select **Sample Route**.



25. Right-click the highlighted route below and select **Compare Route**.



In GeoEvent Sampler, review the sampled event data before it was processed on the left and the event data after being processed on the right. The event records were successfully geotagged with the ZIP code and county based on its spatial relationship with the geofences.

Exercise 3: Track Gap Detector Processor

The Track Gap Detector Processor monitors streaming event data and detects when expected data is not received. You will configure a Track Gap Detector Processor to monitor the incoming vehicle event data. You will configure the processor to send an alert when a vehicle stops transmitting its location data. This is useful for informing operations personnel when a vehicle is disabled or if a vehicle's transmitting device is not working as expected.

1. In **GeoEvent Manager**, from the **Manager** page, click **Add Service**.
2. For **Name**, type `Track Gap Detector` and click **Create**.
3. From **New Elements**, double-click **Processor** and specify the parameters as follows:
    a. For **Name**, type `Vehicle Track Gap Detector`.
    b. For **Processor**, select **Track Gap Detector**.
    c. For **Gap Notification Mode**, select **On Change**.

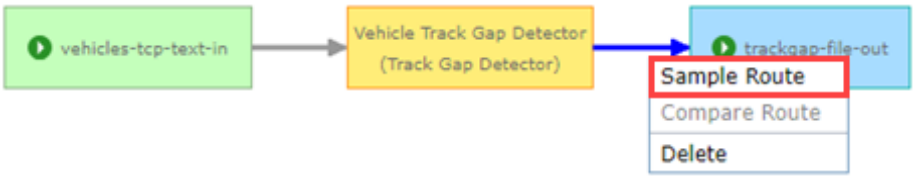
d. For **Gap Duration (seconds)**, type 10.

e. For **Gap Detection Interval (seconds)**, type 5.

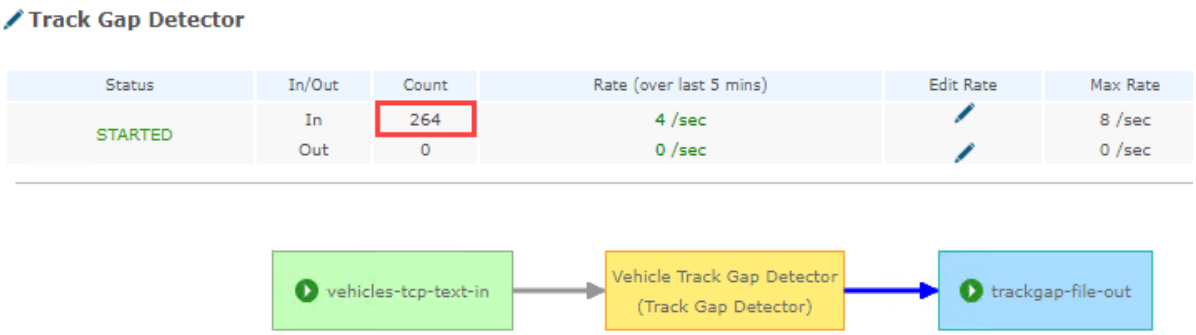
f. For **Geometry Field**, select **GEOMETRY**.

4. Click **OK** to add the processor.
5. From **Inputs**, drag-and-drop the **vehicles-tcp-text-in** input into the service designer.
6. From **Outputs**, drag-and-drop the **trackgap-file-out** output into the service designer and start the output.
7. Configure the GeoEvent Service as illustrated below:

8. Click **Publish** to publish the GeoEvent Service.
9. Right-click the highlighted route and click **Sample Route**.



10. Verify the count for the **Track Gap Detector** GeoEvent Service is increasing.

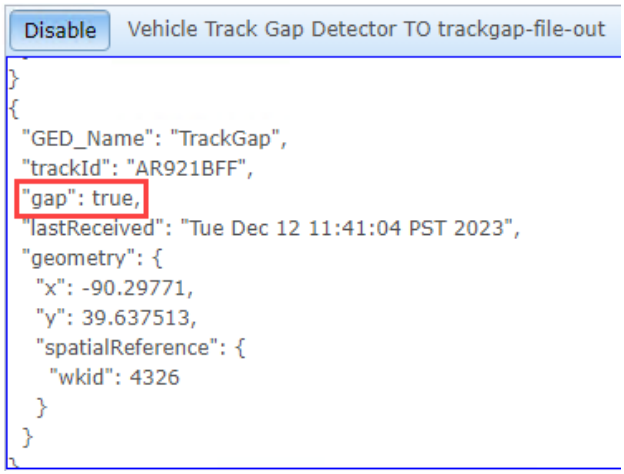


NOTE: *If the event count is not increasing, confirm GeoEvent Simulator is still running, if not, click ▶ to start the simulation.*

You will now simulate a sudden loss in data transmission from the fleet of vehicles by stopping the simulation.

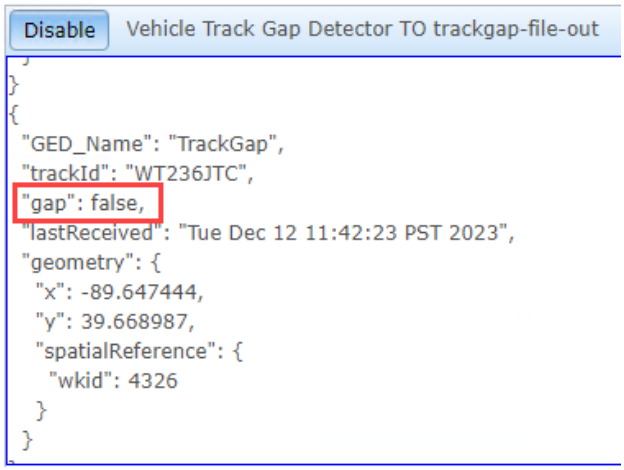
11. In **GeoEvent Simulator**, click ⏸ to stop the simulation.
12. In **GeoEvent Manager**, in the **Track Gap Detector** GeoEvent Service, review the **GeoEvent Sampler** window.

After 10 seconds, event records will appear, indicating that gaps in data were detected for each vehicle. This is evident by the `gap` field which contains a Boolean value of `true` for each event and a timestamp the last event was received.



Since you configured the Track Gap Detector Processor with the **On Change** mode, the processor will notify when a gap is first detected and then again once the event records are being received as expected.

13. In **GeoEvent Simulator**, click ▶ to start the simulation.
14. In **GeoEvent Manager**, in the **Track Gap Detector GeoEvent Service,** review the **GeoEvent Sampler** window.



The new records have a Boolean value of `false` in the `gap` field, indicating that the data is being transmitted again and that there is no active gap.

If you had configured the processor with the **Continuous** mode, the processor would have sent continuous notifications every 5 seconds (based on the **Gap Detection Interval** parameter) until the expected event records were received.

The **On Change** mode is useful in situations when you do not want notifications sent every time a change is detected. For example, if you are sending the processed data to an email output, you only want to notify operations personnel that a vehicle is not sending data and then another email to notify when the vehicle is again sending data. You do not what emails sent continuously in this case.

Lesson clean-up

With the lesson complete, you can now perform the following tasks to clean-up your GeoEvent Server machine, if necessary.

- Reset your GeoEvent Server configuration in **GeoEvent Manager** by navigating to **Site** > **GeoEvent** > **Configuration Store** and click **Reset Configuration**.
- Delete the **vehicles_stream**, **speeding_incidents_stream**, and **boundary_incidents_stream** stream services.
- Delete the web map.
- Delete the folders and files in the directory below:

  `C:\GeoEvent\output`

Summary

By completing the exercises in this lesson, you learned how to configure several processors that enable more advanced real-time workflows in your organization. Continue to Lesson 6 in which you will explore several more processors that enable real-time spatial processing.