Patrick Hill

A short guide to working with the Common Alert Protocol (CAP) Adaptor for GeoEvent Processor for ArcGIS Server

Tutorial: Configuring the Cap Adapter for GeoEvent Processor.

Contents

[Before Deploying the CAP Adaptor 1](#_Toc378604607)

[Create CAP Feature Service Package 1](#_Toc378604608)

[Deploy CAP Adaptor 1](#_Toc378604609)

[Create CAP-Http connector 2](#_Toc378604610)

[Create Input Service 4](#_Toc378604611)

[Create Output Services 4](#_Toc378604612)

[Create the CAP GeoEvent Service 6](#_Toc378604613)

[Appendix A: Memory Management for the CAP Adaptor 7](#_Toc378604614)

[GeoEvent Definitions Created upon deploying CAP Adaptor 3](#_Toc378606447)

[Configuring the CAP input Connector 4](#_Toc378606448)

[Configuring CAP-FEMA-http Input Service 5](#_Toc378606449)

[Configuring the CAPAlert-fs-out Service 6](#_Toc378606450)

[Configuring Table Update Output Services 6](#_Toc378606451)

[Configuring CAPInfoAreaGeometry-fs-out Service 6](#_Toc378606452)

[Configuring the CAP-json-out Service 7](#_Toc378606453)

# Before Deploying the CAP Adaptor

In this tutorial you will connect to a live stream of Common Alerting Protocol (CAP) alerts broadcast by the Federal Emergency Management Agency (FEMA). Before deploying the adaptor your organization must obtain an Integrated Public Alerting Systems (IPAWS) OPEN Developers pin id. The pin will be passed into the adaptor as an http parameter in order to get the CAP stream. To obtain the pin a Memorandum of Agreement (MOA) must be obtained and executed through FEMA. Details for obtaining the MOA can be found at <http://www.fema.gov/media-library-data/20130726-1917-25045-5128/how_to_sign_up_for_ipaws_fact_sheet_20130517.pdf>.

# Create CAP Feature Service Package

In ArcCatalog, browse to the CAP Adapter location and double click on the CAPAlerts.mpk. A map document with configured tables and feature class will open.[[1]](#footnote-1) You will need to export all tables and the feature class to an enterprise geodatabase and referencing the new tables and feature class in your map document before moving on to the next step. Once exported and the layers reference data in the enterprise geodatabase save the map document. In ArcMap right click the file tab ans select ‘Share’. In the sharing options choose ‘Share as Service’. Follow the dialog instructions to create the service. In the service editor’s ‘Capabilities’ tab make sure you select ‘Feature Access’ and in the ‘Feature Access’ subfolder make sure the checkbox next to ‘Apply default z-value’ is checked. Click the ‘Analyze’ button and fix any resulting errors. Once errors are resolved, click the ‘Publish’ button to create the feature service.

# Deploy CAP Adaptor

In a file browser, go to the location where you unzipped the Cap-Adapter files. Find the cap-adapter-10.2.0.jar file. Copy this file and go to <GeoEvent Processor Install Location>/deploy. Paste the jar file into the deploy folder.

In GeoEvent for ArcGIS Server’s Geoevent Manager application select the ‘Site’ tab (2nd tab on the upper right). You will see all of the GeoEvent Definitions that are registered on your site. Notice that when you deployed the adapter, a number of GeoEvent Definitions were created for you.

The following geoevent definitions should be displayed:

CAPAlert, CAPAlertCode, CAPInfo, CAPInfoArea, CAPInfoAreaGeom, CAPInfoCategory, CAPInfoEventCode, CAPInfoParameter, CAPInfoResource, and CAPInfoResponseType

|  |
| --- |
|  |
| GeoEvent Definitions Created upon deploying CAP Adaptor |

Depending on the CAP message that is received any or all of these events may be generated.

# Create CAP-Http connector

Once you have deployed the CAP Adapter, you must create a connector from the CAP adapter and one of the available transports (depending on the method for which your feed transmits CAP messages). Typically you will want to couple the CAP Adapter with the http transport. For the purposes of this demo we will use the HTTP transport, so that we can receive CAP messages from a live feed transmitting over the internet.

Next go to the menu selection on the left of manager and click ‘Connectors’. In GeoEvent Processor for ArcGIS Server, a connector is defined as a pairing of an adapter and transport. Both adapters and transports are further defined as inbound or outbound. An inbound connector comprises an inbound adapter and inbound transport. Here we will be creating a connector from the CAP Inbound adapter and the HTTP inbound transport.

Press the ‘Create Connector’ button that appears above the list of available connectors. A dialog similar to the one below will be displayed. Items with a red asterisk are required fields. Provide a uniqu name for the processor (no spaces and the only special characters allowed are dashes and underscores). Provide a human readable label. Provide an optional description. Make sure that ‘Input’ is selected’ for type. In the Adapter and Transport dropdowns select ‘CAP’ and ‘HTTP’ respectively. Next provide a Default Input Name (new instances of the connector will have this name unless changed by the user).

The next step is to configure the properties of the connector. The configure properties dialog’s properties may be moved from the ‘Shown’, Advanced’ and ‘Hidden’ windows, using the arrows.

|  |
| --- |
|  |
| Configuring the CAP input Connector |
|  |

Configure the properties as shown in Figure 1. Once configured click ‘Save’. The CAP-HTTP inbound connector should appear in the list of connectors on your Geoevent Server site.

# Create Input Service

Now that you have created an input connector you can create an input service. In Geoevent Manager for ArcGIS Server click on the services tab and select ‘Inputs’ from the service tabs. Next select ‘Add Service’. You will now see a list of the available input service connectors that are available. Choose the CAP cionnector that you just created (note: it will be sorted by the label you gave the connector when you created it). Assign the properties as follows:

|  |  |
| --- | --- |
| Configuring CAP-FEMA-http Input Service | |
| Name | CAP-FEMA-http |
| URL | https://tdl.apps.fema.gov/IPAWSOPEN\_EAS\_SERVICE/rest/public/recent/2012-08-21T11:40:43Z[[2]](#footnote-2) |
| Parameters | pin=<your FEMA pin> |
| Frequency (in seconds) | 5 |
| Use URL Proxy | No |
| Acceptable Mime Types | application/xml |
| HTTP Method | ‘GET’ |

When you have added all properties click ‘Save’. You will now start receiving CAP messages from the FEMA endpoint.[[3]](#footnote-3) In the ‘Services’ Tabs select ‘Monitor’. You will see CAP messages appear as they are posted to the FEMA website.[[4]](#footnote-4)

# Create Output Services

Next you will need to create some output services for your CAP service. For this tutorial, you will create an output table for each of the tables in present in the CAP-Alerts Feature Service, an output service for the Alert Areas layer of the CAP Alerts Feature Service, and a json output of the CAPS Alerts.

From the Services tab, select ‘Outputs’ and click the ‘Add Output’ button. You will see a list of the output connectors available to your site. Click the ‘Select’ button next to the connector labeled ‘Update a Feature’. Fill in the service properties as follows:

|  |  |
| --- | --- |
| Configuring the CAPAlert-fs-out Service | |
| Name | CAPAlert-fs-out |
| ArcGIS Server Connection | <connection to ags hosting CAP Service> |
| Folder | <Folder location of CAP Service> |
| Service Name | CAP\_Alerts |
| Layer | Alert |
| Unique Feature Identifier Field | Message ID |
| Update Interval | 1 |
| Generate Flat JSON | Yes |
| Delete Old Features | No |
| Maximum Features per Transmission | 500 |

Next you will create 8 more services that will update the CAP tables in the CAP-Alert Service. For each click the copy icon next to the output service you just created. Change the name and layer properties as follows:

|  |  |  |
| --- | --- | --- |
| Configuring Table Update Output Services | | |
| Output Service 1 | Output Service Name: | CAPAlertCode-fs-out |
|  | Layer | AlertCode |
| Output Service 2 | Output Service Name | CAPInfo-fs-out |
|  | Layer | Info |
| Output Service 3 | Output Service Name | CAPInfoCategory-fs-out |
|  | Layer: | InfoCategory |
| Output Service 4 | Output Service Name | CAPInfoEventCode-fs-out |
|  | Layer | InfoEventCode |
| Output Service 5 | Output Service Name | CAPInfoParameter-fs-out |
|  | Layer | InfoParameter |
| Output Service 6 | Output Service Name | CAP InfoResponseType -fs-out |
|  | Layer | InfoResponseType |
| Output Service 7 | Output Service Name | CAPInfoArea-fs-out |
|  | Layer | InfoArea |
| Output Service 8 | Output Service Name | CAPInfoResource-fs-out |
|  | Layer | InfoResource |

Next click ‘Add Output’. From the selection of available output connectors select ‘Update a Feature’. Fill in the properties as follows and Save:

|  |  |
| --- | --- |
| Configuring CAPInfoAreaGeometry-fs-out Service | |
| Name | CAPInfoAreaGeometry-fs-out |
| ArcGIS Server Connection | <connection to ags hosting CAP Service> |
| Folder | <Folder location of CAP Service> |
| Service Name | CAP\_Alerts |
| Layer | Alert Areas |
| Unique Feature Identifier Field | Area ID |
| Update Interval | 1 |
| Generate Flat JSON | Yes |
| Delete Old Features | No |
| Maximum Features per Transmission | 500 |

Now you will create a Service to output CAP Alerts as json. Click ‘Add Output’. Click ‘Select’ next to the ‘Write to .json file’ connector. Fill in the properties as follows and click save:

|  |  |
| --- | --- |
| Configuring the CAP-json-out Service | |
| Name | CAP-json-out |
| Folder | <connection to a registered folder> |
| Filename prefix | cap |

# Create the CAP GeoEvent Service

Now that you have finished creating the input and output services you can create the CAP Geoevent Service. A configured service is provided for you in the docs folder that was downloaded from github. In GeoEvent Processor Manager click on the ‘Site’ tab. And go to the ‘Configuration Store’. Click the ‘Import Configuration’ Button. In the popup dialog click ‘Choose File’ and browse to the <Cap Adaptor Location>/doc/CAPService.ges. Click Import. Click the Services Tab and go to ‘GeoEvent Services’. The CAP Service will be listed among the available services. If not already started, start the Cap service.[[5]](#footnote-5)

Congratulations, you have created a CAP Service!

# Appendix A: Memory Management for the CAP Adaptor

Depending on the amount of traffic channeling through the CAP system, the resources of your system may be taxed. This is especially the case if you are deploying the CAP adaptor on a laptop or desktop machine for development purposes and when large weather events are occurring in the US. If too many CAP events are input to the system in a short period of time, the GeoEvent server may crash because it runs out of memory. In any test/dev environment (i.e. one in which the machine on which the CAP Adaptor is deployed has limited resources) it is advisable to shut down the CAP input connector when not in use or being tested. This will prevent the geoevent server from being overwhelmed by CAP alerts.

Another thing that can improve performance is to increase your JVM’s maximum heap size. Since GeoEvent Server run’s inside an Apache Karaf environment, you can increase the JVM heap size by setting the JAVA\_MAX\_MEM environmental variable, set or reset the variable to a larger number. Typically JAVA\_MAX\_MEM=2048M is a good place to start (on a machine with 8G of RAM this will consume 2G max of RAM). Another option is to set the JAVA\_MAX\_MEM inside the karaf.bat file that is used to instantiate the server. Open the <ges install location>/bin/karaf.bat file as an administrator in a text editor. Search for the string ‘JAVA\_MAX\_MEM’. You will see the following command:

if "%JAVA\_MAX\_MEM%" == "" (

set JAVA\_MAX\_MEM=1024M

)

This command tells Karaf to set the max heap size of the Java Virtual Machine to 1024 Megabytes if the environmental variable JAVA\_MAX\_MEM is not set. Set this to a larger power of 2 toallow a greater amount of RAM be dedicated to the JVM (make sure the environmental variable JAVA\_MAX\_MEM is not already set to a smaller value).

1. The feature class and tables will not have records at this time. [↑](#footnote-ref-1)
2. The date in the URL does not reference the date of CAP messages. Messages will be live, however a date in this format must be present in the URL. [↑](#footnote-ref-2)
3. Depending on the amount of CAP activity, it may take some time before you receive cap alerts. [↑](#footnote-ref-3)
4. In times of a great deal of activity the CAP adapter may consume a large amount of resources. See Appendix A for memory management. [↑](#footnote-ref-4)
5. If any of the import or output services do not have the exact name as demonstrated in this tutorial or are missing, you will receive an error starting the service. Go back and rename or create the offending services. [↑](#footnote-ref-5)