



Real-Time GIS Use Cases and Implementation Patterns

Derrick Burke

Overview

- **Background**
- **Real-Time Data Formats**
- **Updating Real-Time Data**
 - **Products / Patterns / Architecture / Components**

Esri Disaster Response Program

Main

GIS for Emergency Management

Help when you need it most

When disaster strikes, Esri's Disaster Response Program (DRP) is there to support you around the clock, 24 x 7. Request assistance from Esri experts, augment software, explore content, and monitor events online as part of our corporate citizenship. We're there when you need us most.

Request assistance and monitor the following event types:



Hurricanes & Cyclones



Wildfires



Flooding



Severe Weather

- Wind Chill Advisory
- Wind Chill Warning
- Wind Chill Watch
- Winter Storm Warning
- Winter Storm Watch
- Winter Weather Advisory

Weather Stations (wind di... +

Canada Radar +

US Radar +

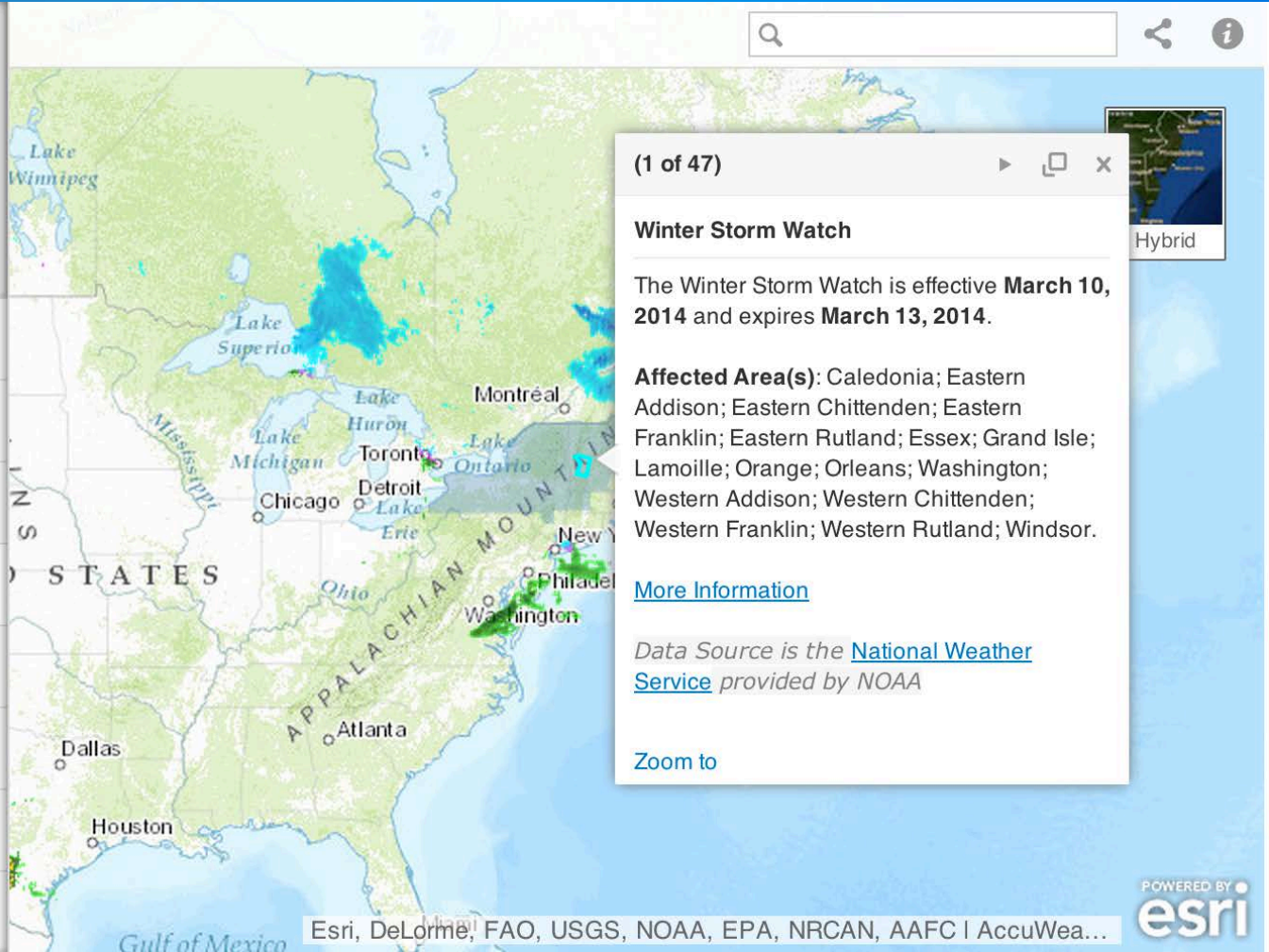
☰ **Social**

Instagram +

Flickr +

Twitter +

Webcams +



(1 of 47) [Close] [Full Screen]

Winter Storm Watch

The Winter Storm Watch is effective **March 10, 2014** and expires **March 13, 2014**.

Affected Area(s): Caledonia; Eastern Addison; Eastern Chittenden; Eastern Franklin; Eastern Rutland; Essex; Grand Isle; Lamoille; Orange; Orleans; Washington; Western Addison; Western Chittenden; Western Franklin; Western Rutland; Windsor.

[More Information](#)

Data Source is the [National Weather Service](#) provided by NOAA

[Zoom to](#)





BREAKING NEWS

SUPERMARKETS, HOMES TOPPLE
Interactive maps show most powerful videos

LIVE
CNN

CHANCE TRUMAN
DISASTER

Real-Time Data, what do we mean?

- **Frequently Changing Content!**
- **Real-Time Data**
 - Changes moment-by-moment
 - Trickle or burst
 - No set intervals
- **Near Real-Time Data**
 - Periodic or Batch changes
 - Bulk updates typical
 - Timed intervals

Typical Data Formats

Real-Time Data

- **Sensors**
 - Vehicles
 - Manufacturing / Industrial
 - Field equipment
 - SCADA
- **Internet Resources**
 - Streaming (Twitter)
 - Wide Range of Formats
 - CSV, XML, KML, RSS, GeoRSS, ...

Near Real-Time Data

- **File based**
 - Shapefile
 - CSV, XML, KML, RSS, GeoRSS, ...
 - Raster / Spatial Analysis
 - NetCDF
 - BIN
- **Bulk / Batch**
- **Heavy Geoprocessing / Enrichment**
- **Data Transformation**
- **Data Aggregation (multiple sources)**

Available Products

- **GeoEvent Extension (GEE)**
 - Selected Content
 - OSIssoft – PI Integrator for ArcGIS
- **Aggregated Live Feed (ALF) methodology**

Update Patterns

(which product do I choose?)

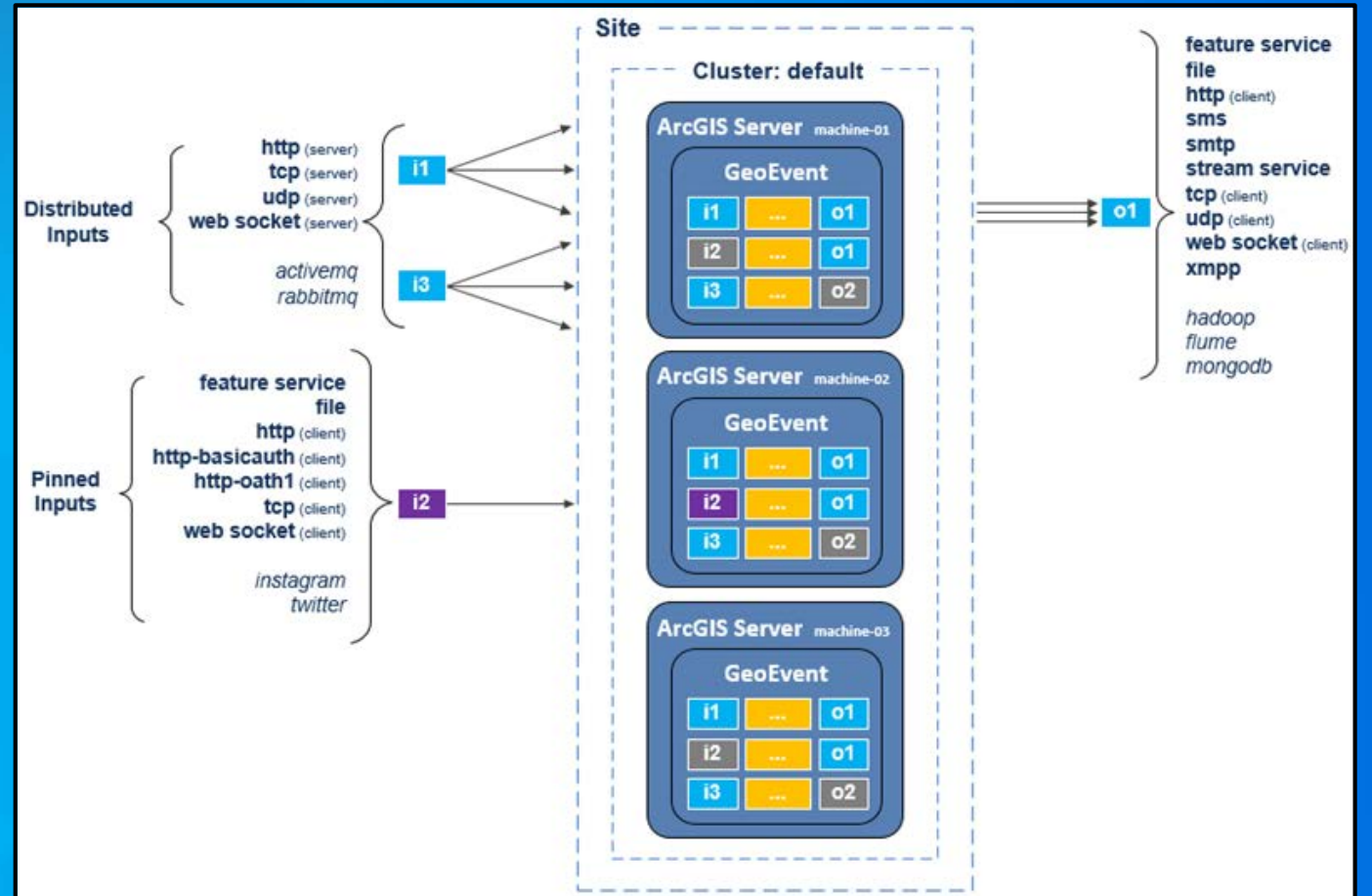
- **SCADA System w/Alerts**
 - GeoEvent Ext. / OSIsoft
- **Raster Weather Data**
 - ALF – ArcPy w/Spatial Analyst
- **Vehicle Tracking**
 - GeoEvent Ext. w/GeoFence
- **Shapefile Processing**
 - ALF – ArcPy

Source / Function	GEE	ALF
Sensors Networks	X	*
Vehicle Tracking	X	*
Raster		X
Weather Data	*	X
Shapefile		X
File GDB		X
XML / KML	X	X
CSV	X	X
JSON	X	X
RSS / GeoRSS	X	X
BIN		X
NetCDF		X
Internet Streams	X	*
Geoprocessing		X
GeoFence	X	*

* = Depends on format and / or architecture

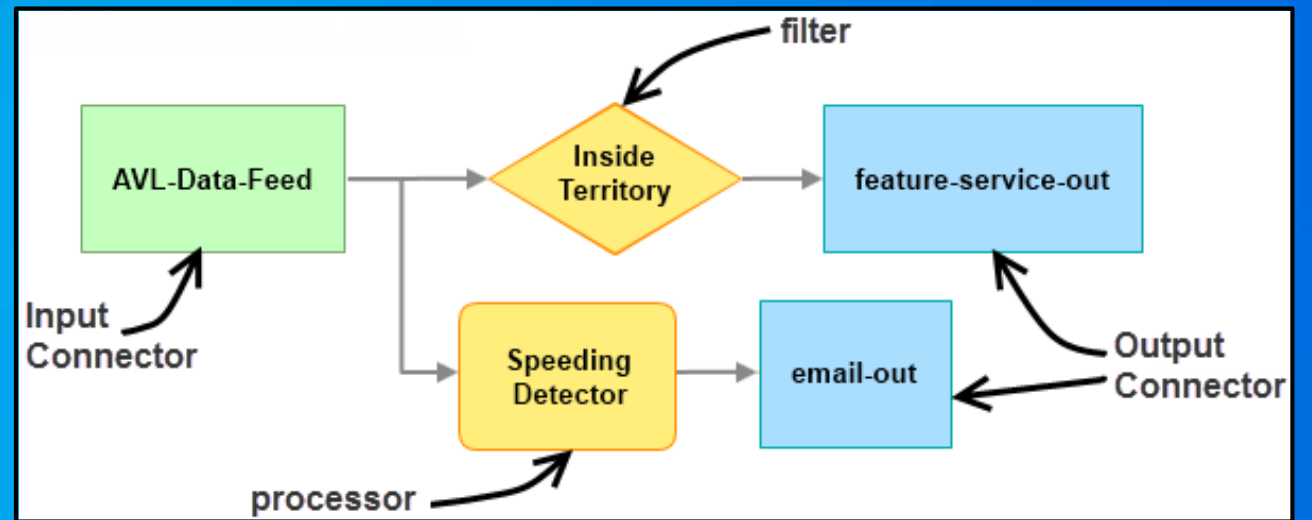
ArcGIS Server GeoEvent Extension

- Data Bridge
 - Feature Service
 - Expose Stream Service
 - ArcGIS Online
 - Others
- HA w/Clusters



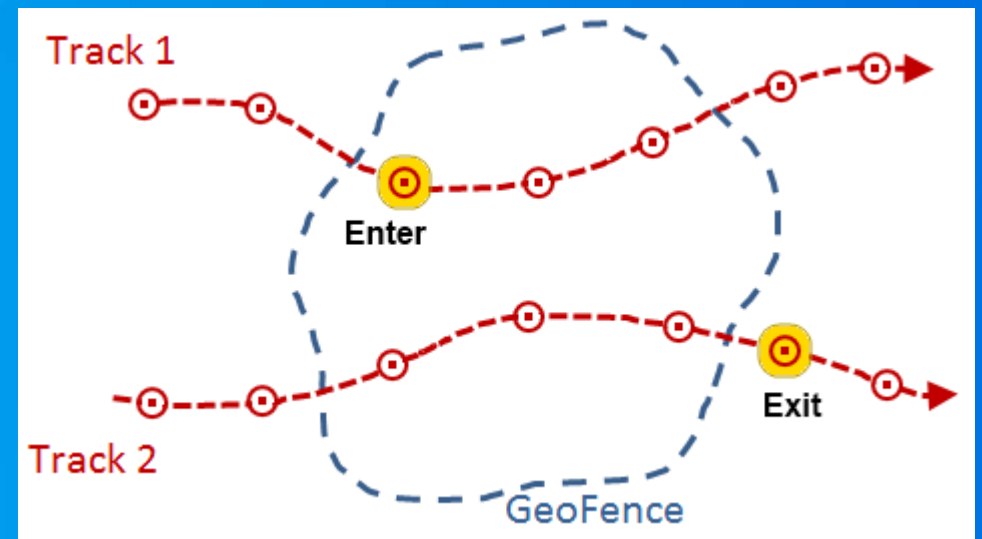
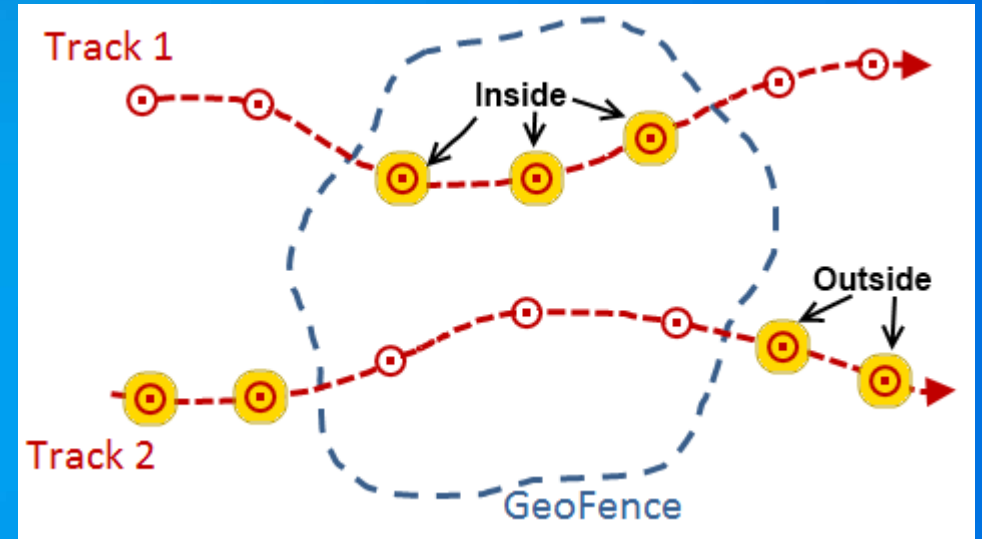
GeoEvent Extension Components

- Input Connector – Read
 - OSIssoft – PI Integrator
- Decision – Filter
- Compute – Processor
- Output Connector – Write



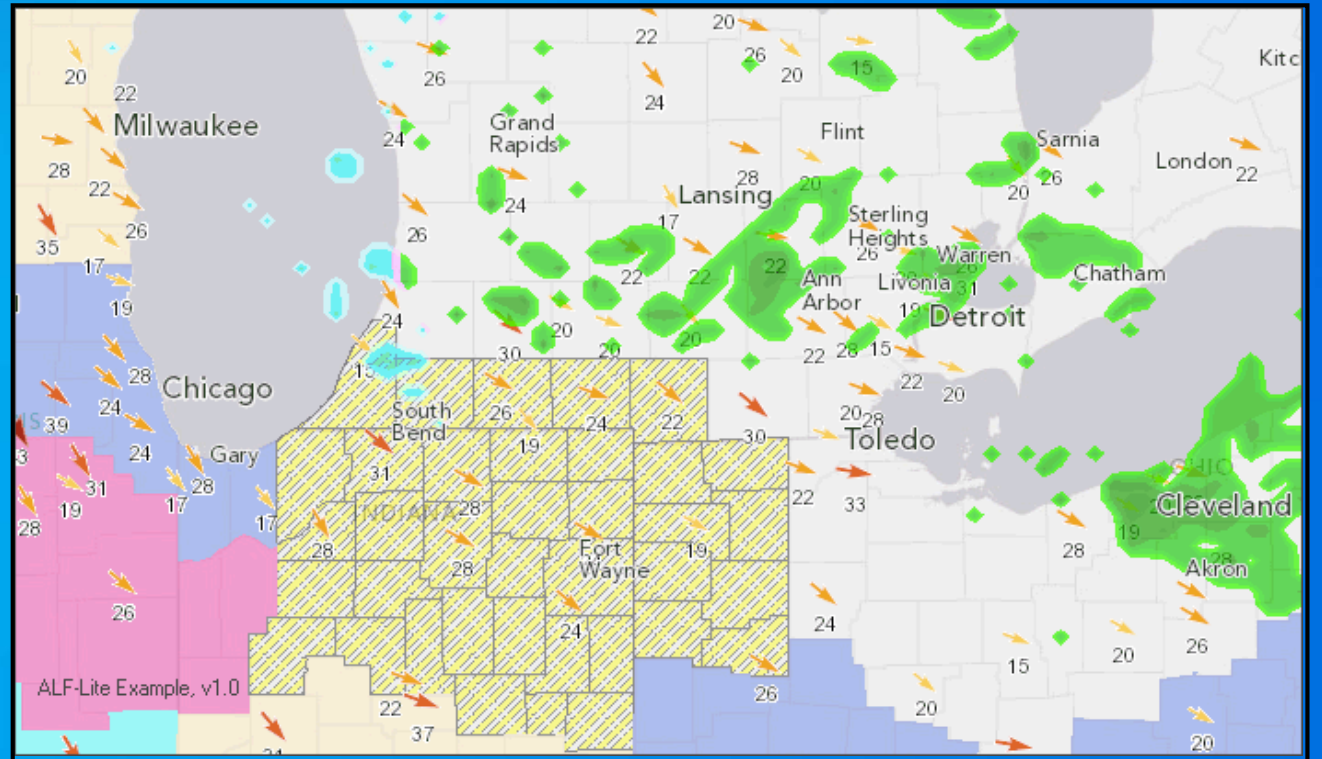
GeoEvent Extension (cont)

- **GeoFence Alerting**
 - Polygon(s)
 - Spatial Filter
- **Position Tracking**
 - Inside / Outside
 - Enter / Exit

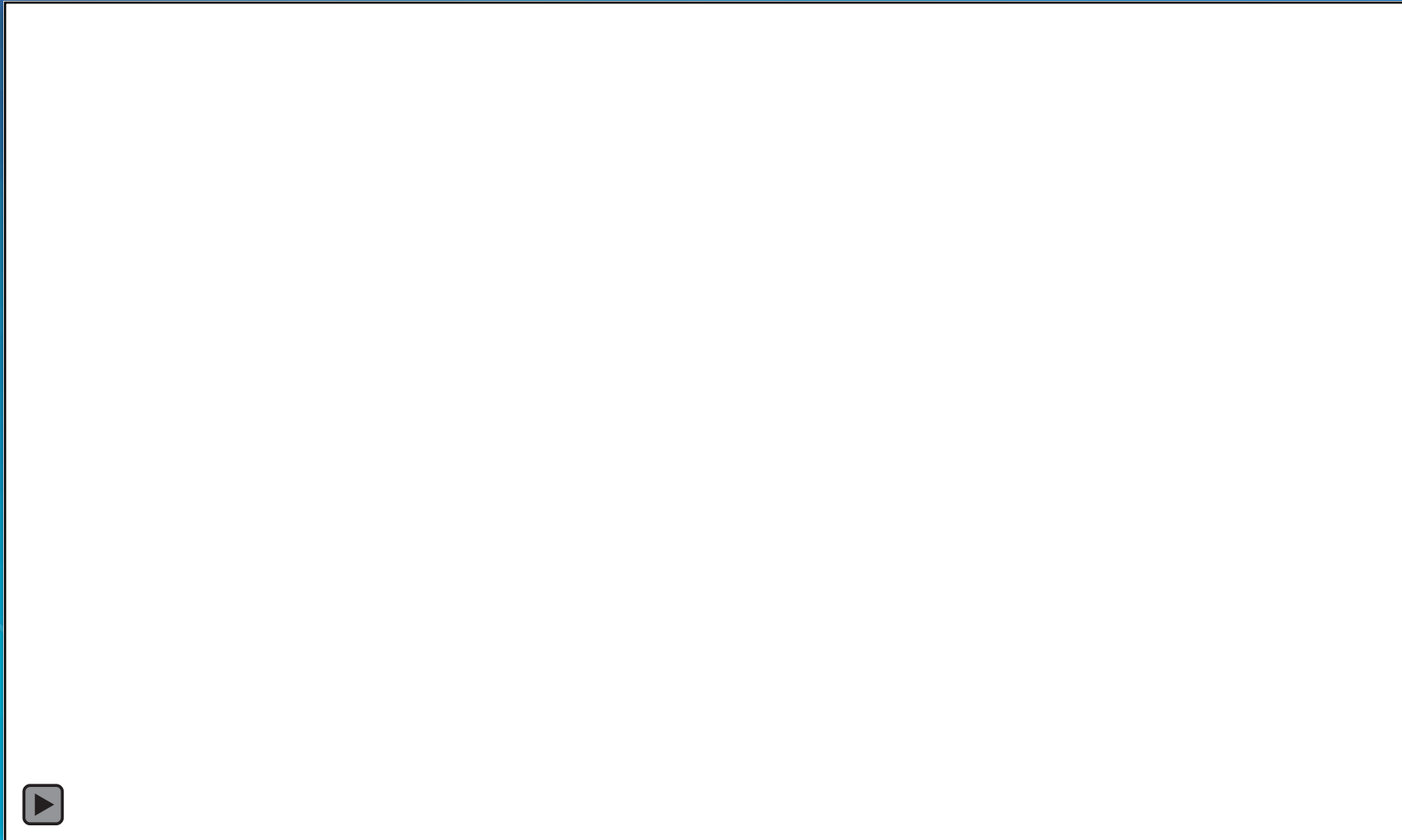


Aggregated Live Feed (ALF) Methodology

- Python Solution
 - GP w/ArcPy
- Update / Output
 - Read-Only File GDBs
 - Feature Services
 - Others...Analysis
- Flexible & Extensible
- HA w/Redundancy

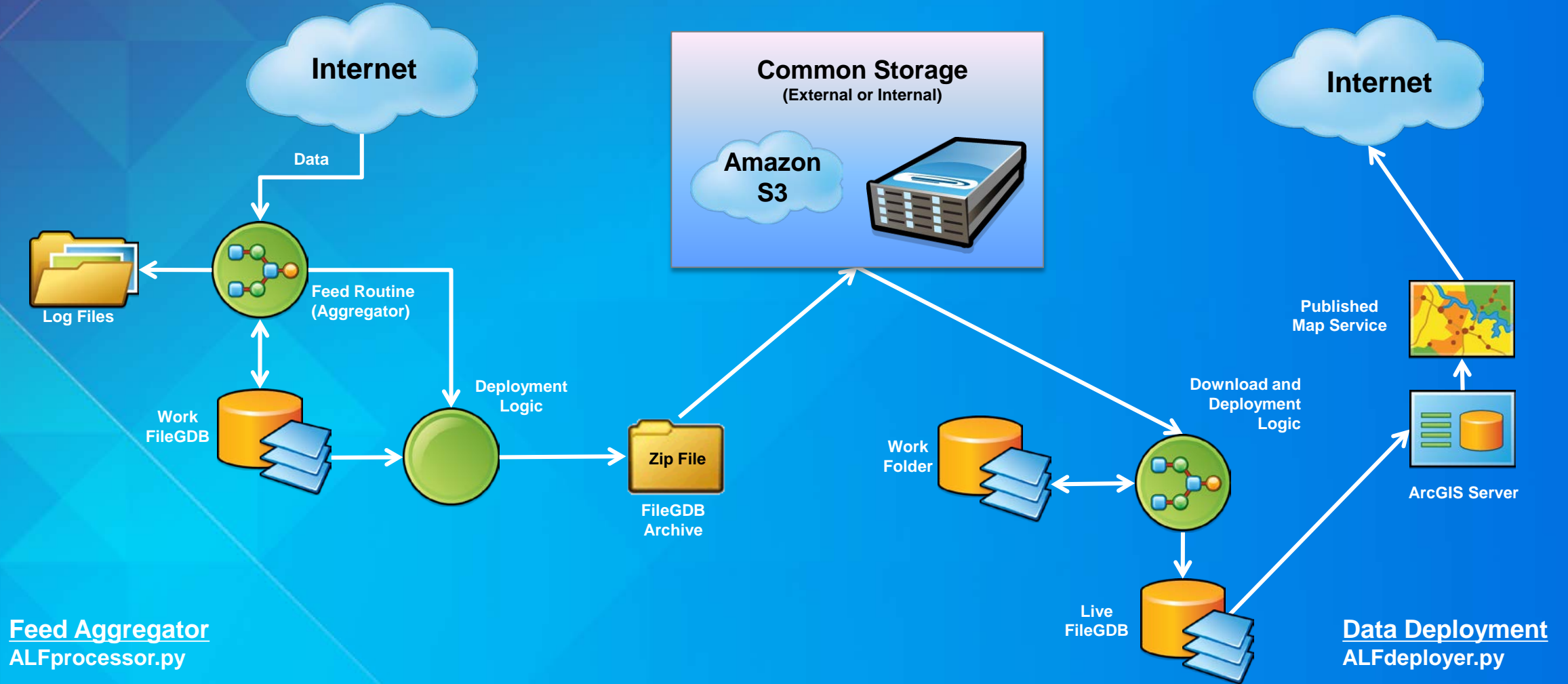


ALF Methodology – NDFD Precipitation, Raster Processing



http://tmservices1/arcgis/rest/services/LiveFeeds/NDFD_Precipitation/MapServer

ALF Methodology – Cloud / Distributed Feed



ALF Feed Construction – What's required

- **Pre-requisites**

- Python
- ArcPy
- Others (.py, 7zip, degrib, ...)

- **Optional**

- IDE – PyScripter, VS, ...

- **Components**

- **ALFlib.py**
 - Function / Class Library
- **ALFprocessor.py**
 - Feed Processor +
 - '<feed file>.cfg' (data processing logic)
- **ALFdeployer.py**
 - Archive Distribution

Questions & Comments?

- **AGOL Community Page (samples, scripts)**
 - <http://esriurl.com/LiveFeed>
- **GeoEvent Extension Resources:**
 - <http://server.arcgis.com/en/geoevent-extension/>
 - <https://techsupport.esri.com/Products/PI-Integrators/PI-Integrator-for-Esri-ArcGIS/System-Requirements>
- **Live Data Feeds :**
 - <http://blogs.esri.com/esri/arcgis/2014/07/09/new-live-feeds-added/>
 - <http://tmservices1.esri.com/arcgis/rest/services/LiveFeeds>

Rate This Session

www.esri.com/RateMyUserConferenceSession

Thank You!

pdodd@esri.com

dburke@esri.com

[@derrickburke](#)



Understanding our world.