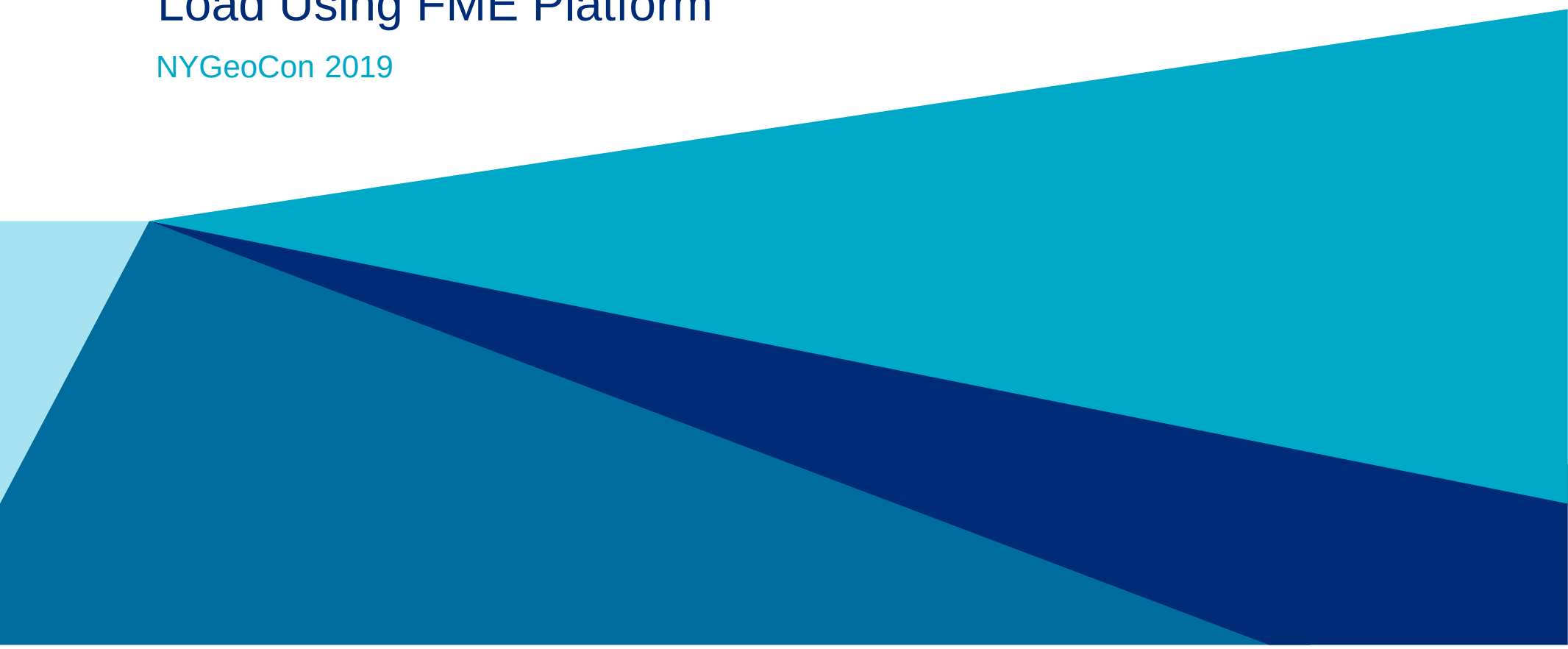
GUY CARPENTER

Automated Catastrophic Events Geographic Data Load Using FME Platform

NYGeoCon 2019



MARSH & McLENNAN COMPANIES

Today’s Speakers

Yash Kaja

Application Engineer

GUY CARPENTER

Lesley Mackenzie

Business Analyst

Consortech.

Agenda

- Introduction
- About Guy Carpenter
- What is FME?
- Why FME?
- Data Integration
- Application Overview
- Use cases

Guy Carpenter: Well Positioned to Help Our Clients Achieve Success

EXPERIENCE

Placed **$33 billion** in ceded premium for **2,500 clients in 2018**

REACH

Our **3,100 employees** sit in **over 60 locations worldwide**

IMPACT

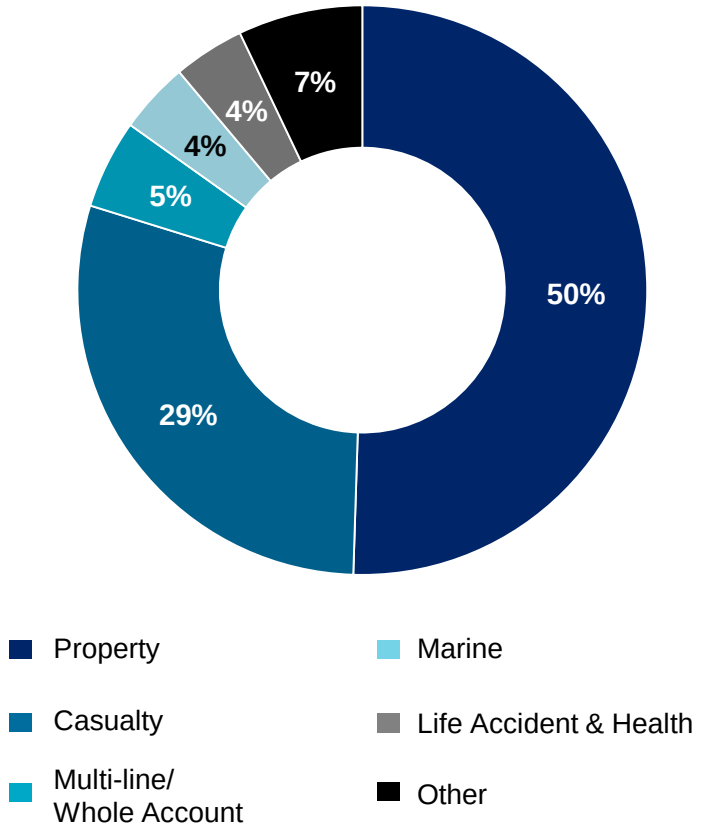
Deliver a powerful combination of:

1. **Broking expertise**
2. **Strategic advisory services**
3. **Industry-leading analytics**

STRENGTH

Part of Marsh & McLennan Companies, a **$15 billion professional services firm, since 1923**

Ceded Premium by Line of Business



GC Analytics® Cat Risk Platform

A global advanced risk management platform featuring a suite of applications to transform your data into actionable business strategies

Portfolio Risk Management
Superior Understanding

Accumulation Analysis
- ✓ Portfolio Based
- ✓ Hazard Proximity
- ✓ Geographic Boundaries

Modelled Loss Evaluation
- ✓ Drill to Policy Level
- ✓ Deterministic / Conditional Scenarios

Underwriting Support
Planning and Execution

Underwriting Strategy Evaluation
- ✓ Impact on Profitability

Policy Level Evaluation
- ✓ Marginal AAL, Reinsurance & Other Costs
- ✓ Hazard and Accumulation Indicators

Catastrophe Response
Monitoring and Analysis

Identification of Impacted Exposures
- ✓ Live Event Feeds for All Major Perils
- ✓ Broadly Sourced Post Event Footprints
- ✓ Historical Events

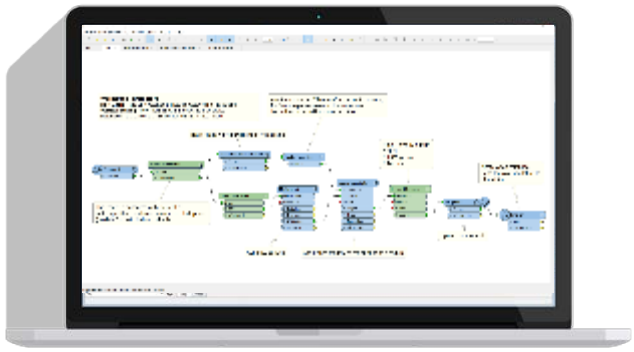
Claims Response Support

Integrating Big Data with the Latest Risk Management and Visualization Techniques

What is FME ?

FME® Integration Platform

Connect. Transform. Automate.



FME Desktop

Build & Run Workflows

FME Server

Automate Workflows (on-premises)

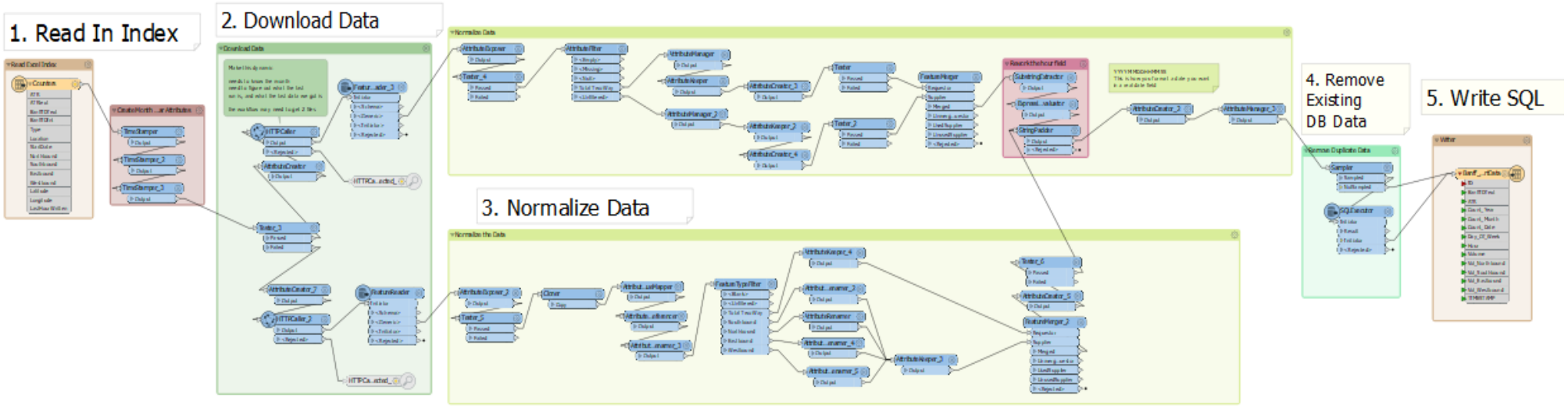
FME Cloud

Automate Workflows (cloud)

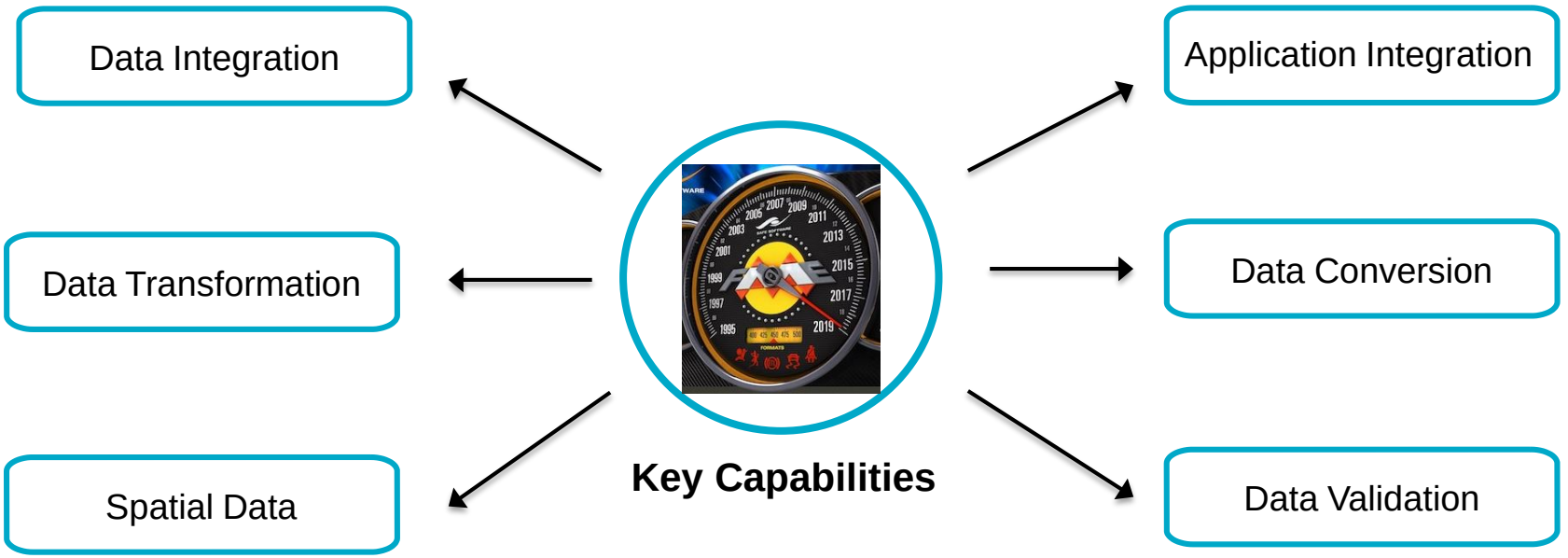
FME is the data integration solution with the best support for spatial data worldwide.

FME Desktop in Action

Traffic Data Download Process



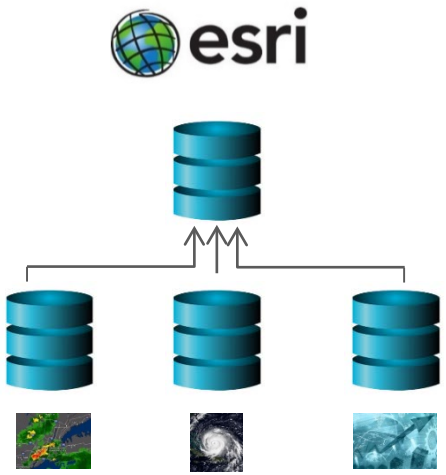
Why FME?


Data Integration
Data Transformation
Spatial Data
Key Capabilities
Application Integration
Data Conversion
Data Validation

Data Validation Means Verifying…

- ✓Data model or schema
- ✓Attribute values
- ✓Attribute domains
- ✓Geometry
- ✓Spatial relationships
- ✓Standard compliance

Data ⇨ **FME** ⇨ **Digital Maps**



Database & ETL

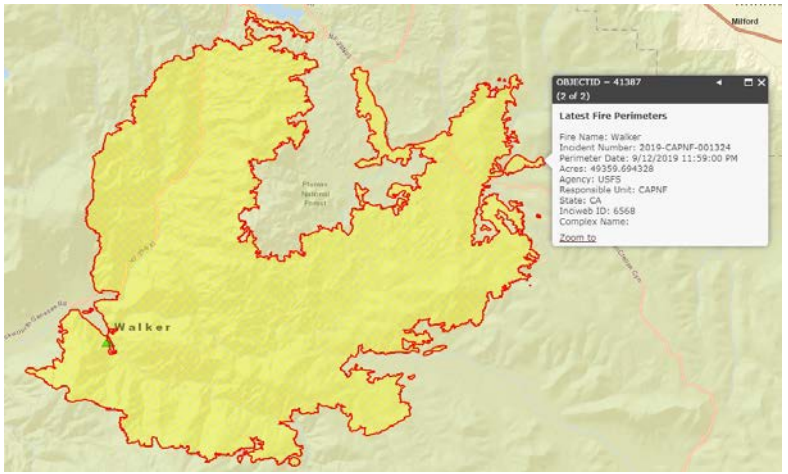
Domains using FME

- Geographical Data
- Catastrophe Events Data
- Relational Data
- Financial Data
- Security
- Relational Database
- ArcGIS

FME Data Integration in Cat Risk Platform

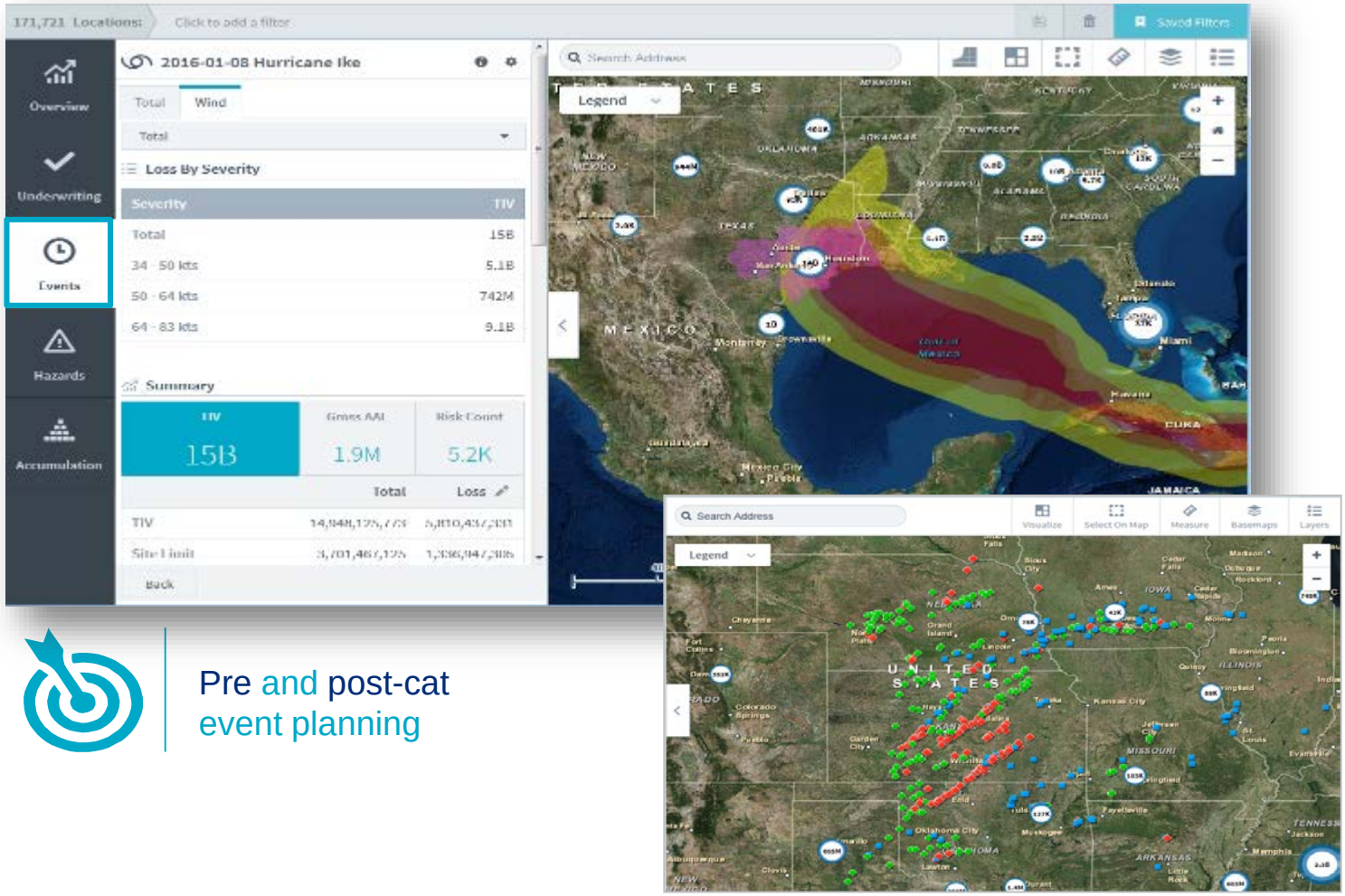
- Automated data feeds using FME tool
- Data feeds include for Hurricanes, Severe Weather, Hail, Wind, Tornado, Earthquakes, WildFires, Floods, Winterstorm perils.
- Different data types include .SHP, KML, JSON/GeoJSON, CSV, XML formats
- Provides event footprints on demand

Aerial View of Walker Wildfire, CA
Source: sacbee



Event Footprint of Walker Wildfire, CA
Source: GeoMAC

Cat Risk Platform Overview
Catastrophe Response



Pre and post-cat event planning

CATASTROPHE RESPONSE

- ✓ Manage your exposure to forecasted or historical events including, Hurricanes, Severe Weather, Wildfires and Earthquakes
- ✓ Understand how many claims you might have or verify new claims as they come in
- ✓ Move event tracks to determine the impact if a storm moved in one direction or another
- ✓ Run analyses easily and produce stunning maps

Cat Risk Platform Overview
Catastrophe Response

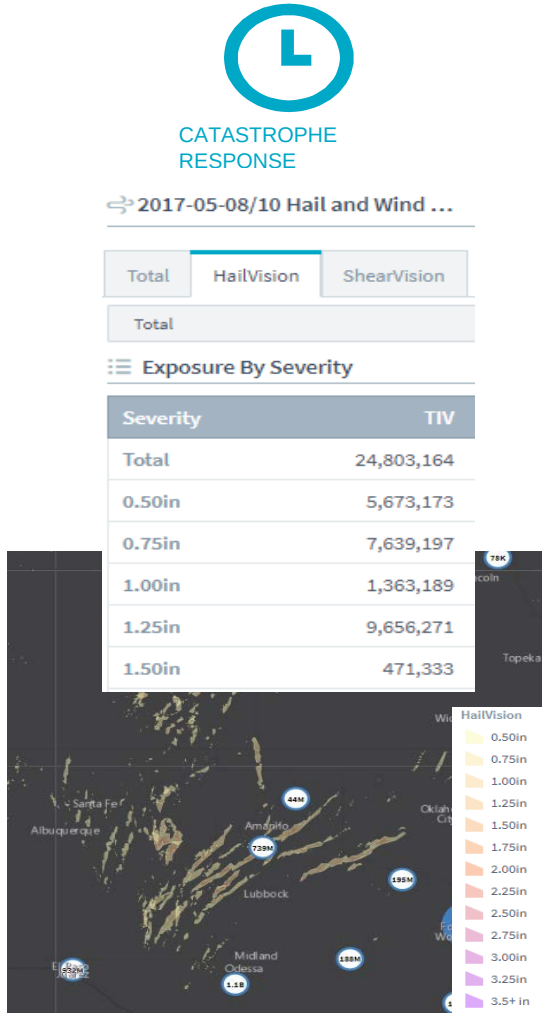
Tropical Cyclone (Global)
5-day Forecast and Observed Saffir Simpson Scale windbands provided by Kinetic updated within an hour after the official NOAA forecast

Earthquake (Global)
Realtime earthquake impact with MMI and PGA maps provided by USGS

Flood (UK)
Flood alerts provided by the UK Environmental Agency

Severe Weather (US)
Radar based hail and tornado swaths provided by IBM and observed locations provided by NOAA SPC

Wildfire (US)
Daily updated wildfire perimeters provided by GeoMac



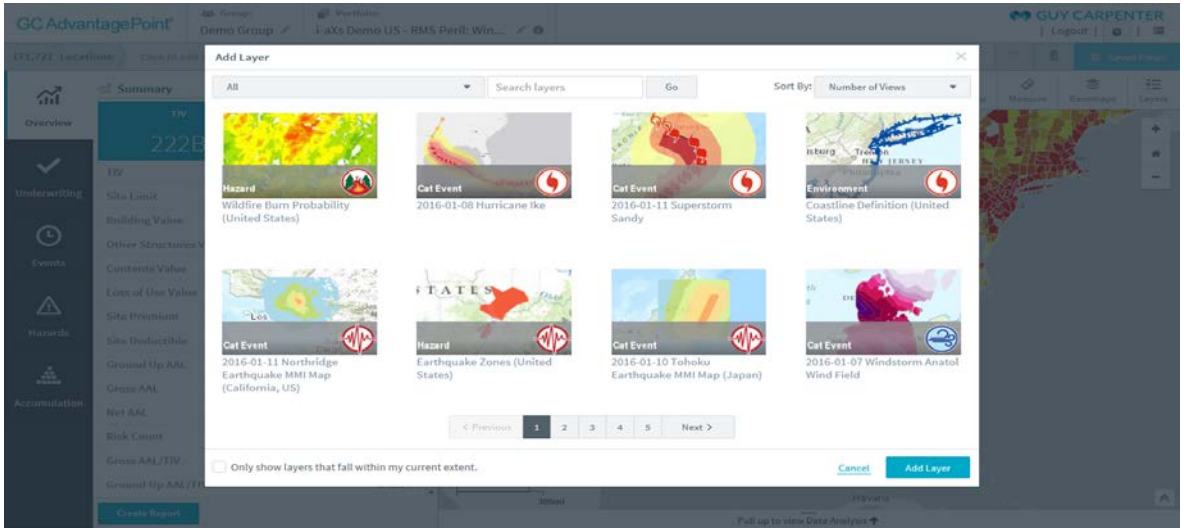
Cat Risk Platform

Use case

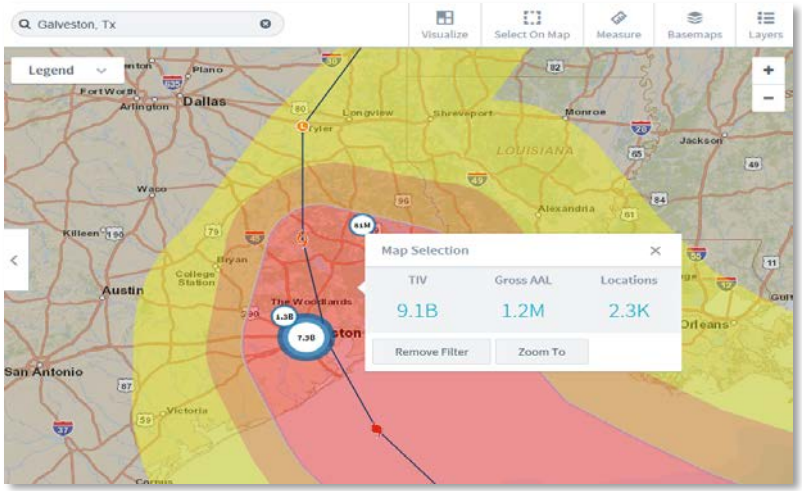
Catastrophe Response

Monitoring and Analysis

- Real-time weather event tracking
- Identify the potential consequences of a catastrophe with ‘what-if’ scenario planning
- Assists Risk Managers to set cat response plans and manage the claims process
- Access to event footprints
- Assess the exposure to events across perils including tropical cyclone, earthquake, wildfire, flood, hail and tornado
- Essential for resource planning
- Pre-event assessment and post-event response

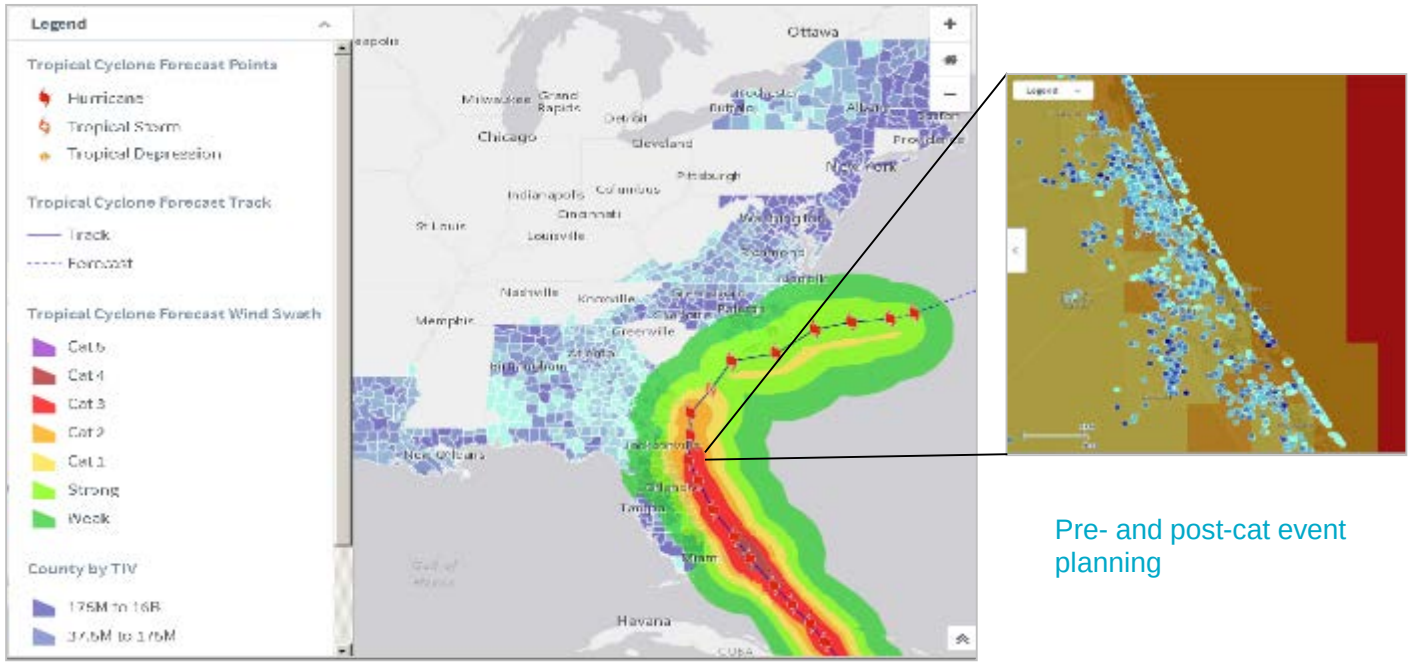


- Layers for different perils
- Add layer for detailed views



- Simply click on the map layer to estimate your portfolio exposure
- Add it to the filter for a summary analysis and export a list of locations

Access to Pre/Post Event Planning and Preparedness



Pre- and post-cat event planning

- ✓ Performing an accumulation analysis on the portfolio
- ✓ Footprints give insight into event severity on the ground

Hurricane Matthew – Oct 7, 2016

Identified accumulations of insured locations affected by the storm via a map and summary of exposure by severity for the observed track

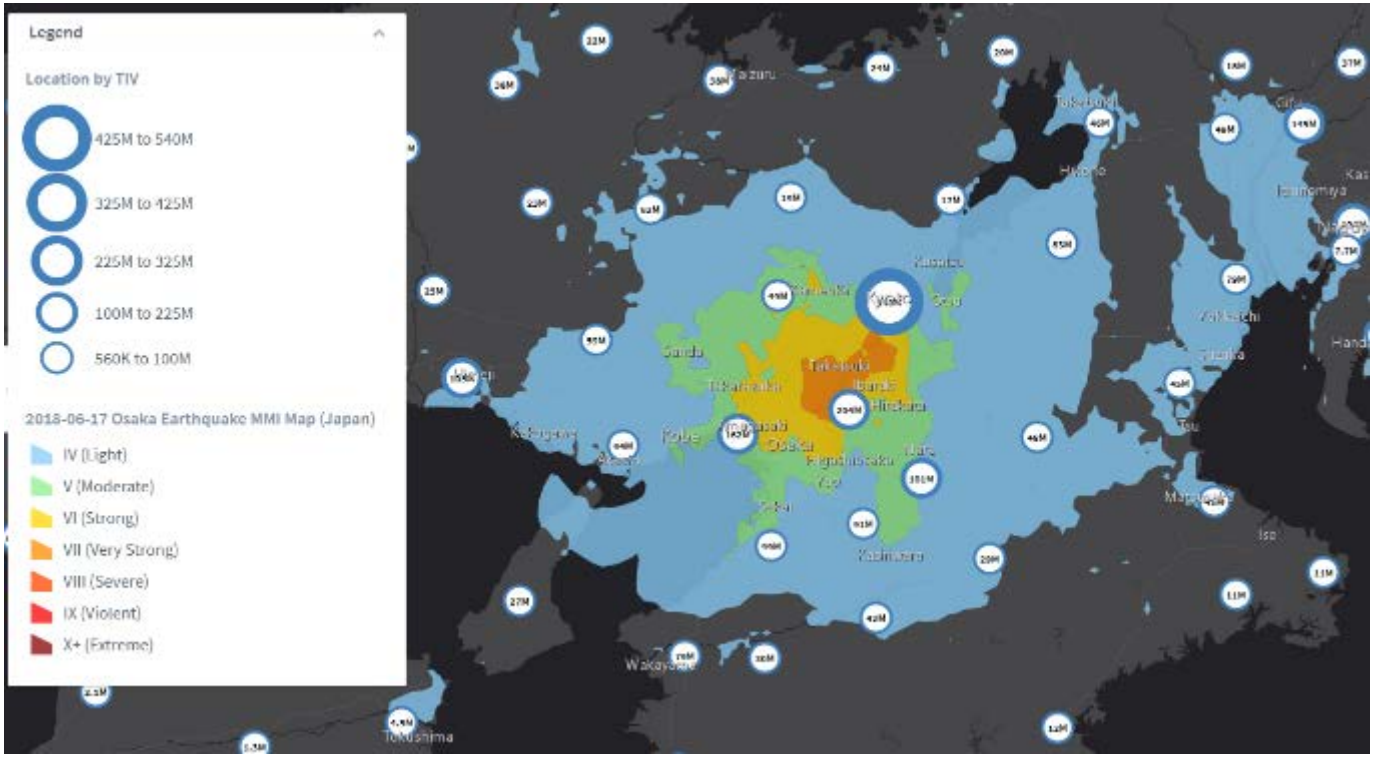
Evaluated potential storm surge flooding via NHC hazard layer analysis to identify portfolio locations across surgec

- ✓ Event footprints can be used for claims validation; e.g. investigation of the occurrence of claims within the event footprint as compared to the initial exposure
- ✓ Manage developing risk from catastrophes of varying scales

Hurricane Dorian– September, 2019

Identified accumulations of insured locations affected by the storm via a map and summary of exposure by severity for the observed track

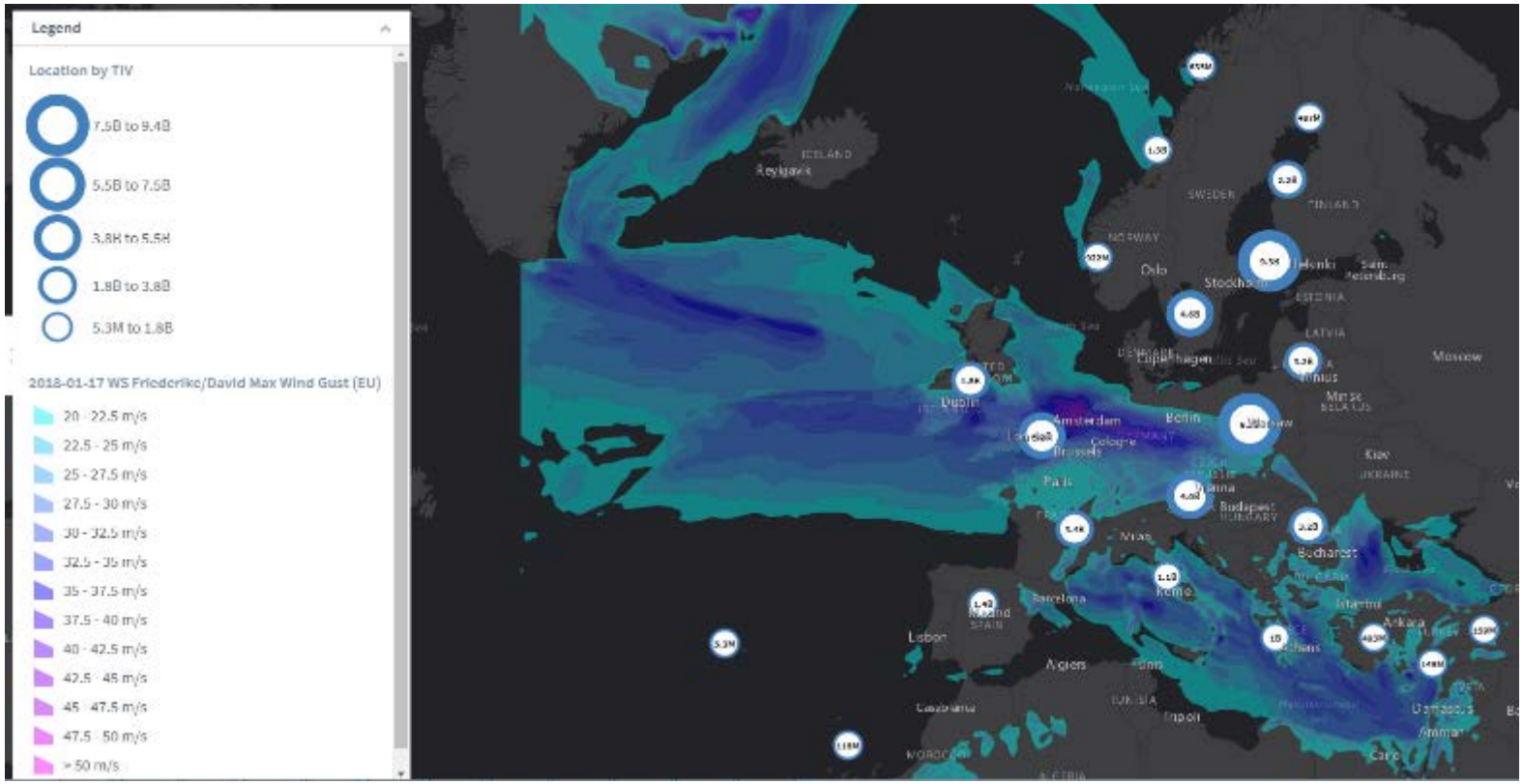
Evaluated potential storm surge flooding via NHC hazard layer analysis to identify portfolio locations across surge



Osaka Earthquake, Japan – Aug 17, 2018

Identified accumulations of insured locations affected by the earthquake via a shake map and summary of exposure by severity for the MMI band

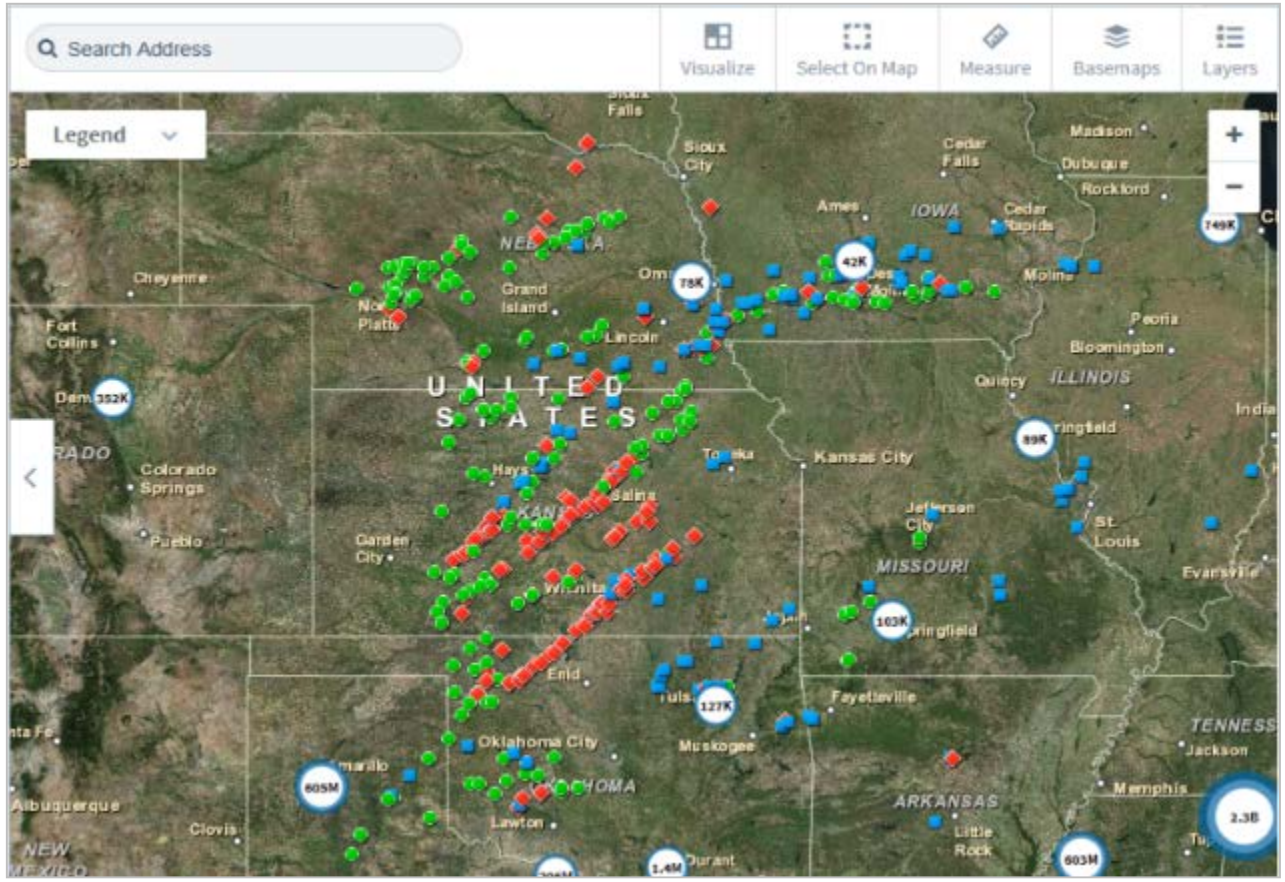
Provided by USGS



Winterstorm Friederike/David Post-Event Speed Contour Line – Jan 17, 2018

Identified accumulations of insured locations affected by the Winterstorm Friederike via a contour line map and summary of exposure by severity for the wind gust

Provided by EuroTempest



Local Strom Reports

Reports of Hail, Tornado and Wind across US locations. Provided by NOAA

Disclaimers

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Technical Highlights

Who is Consortech?

30 YEARS

10 experts

100+ projects

ETL – GIS certified experts

Integration and Automation

Solution Development

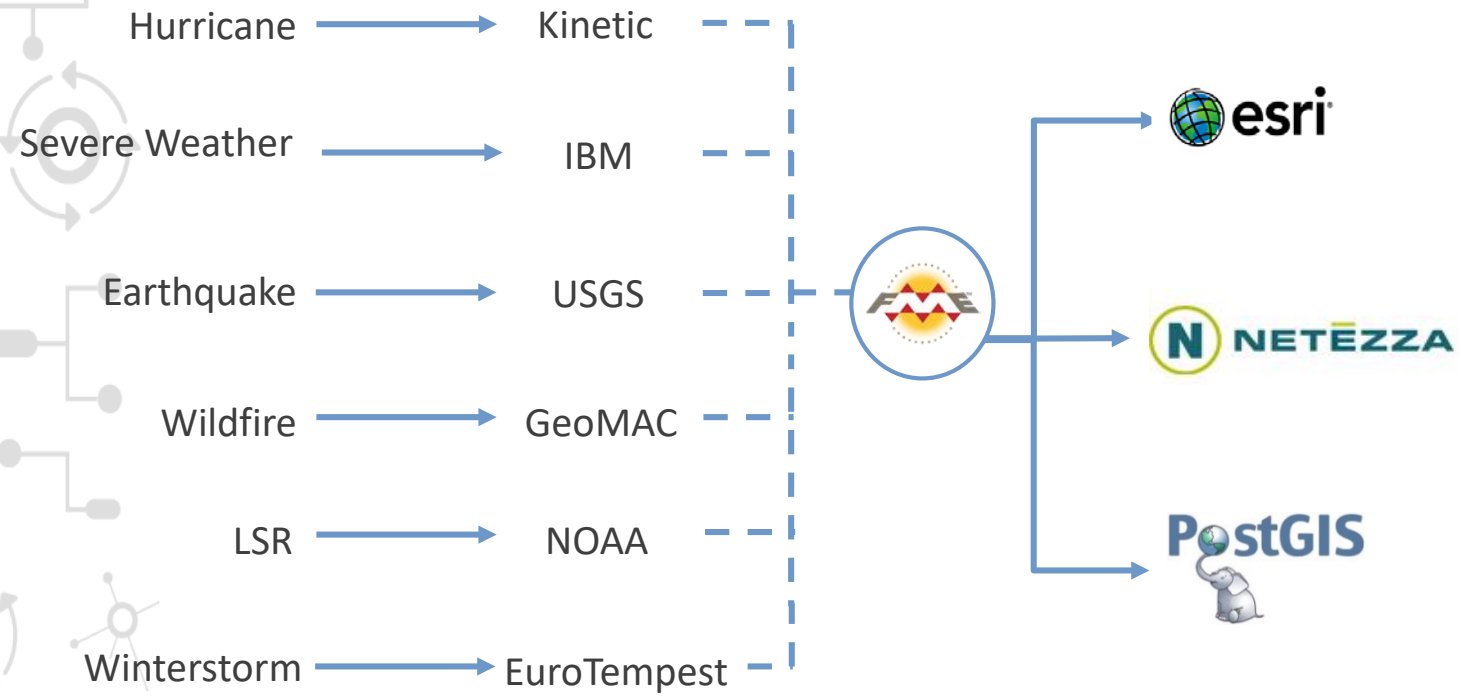
SAFE SOFTWARE ★★★ PLATINUM PARTNER

CERTIFIED Professional

CERTIFIED Trainer

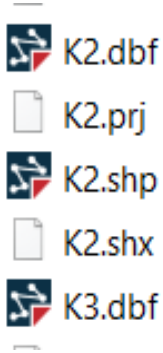
CERTIFIED Server

Pulling Data from Many Web Sources



Different Formats Coming In

- APIs
  - REST Services
  - SOAP Services
- Shapefiles
- CSV



Upload Frequency

Real-Time?

1 x per month?

1 x per Week?

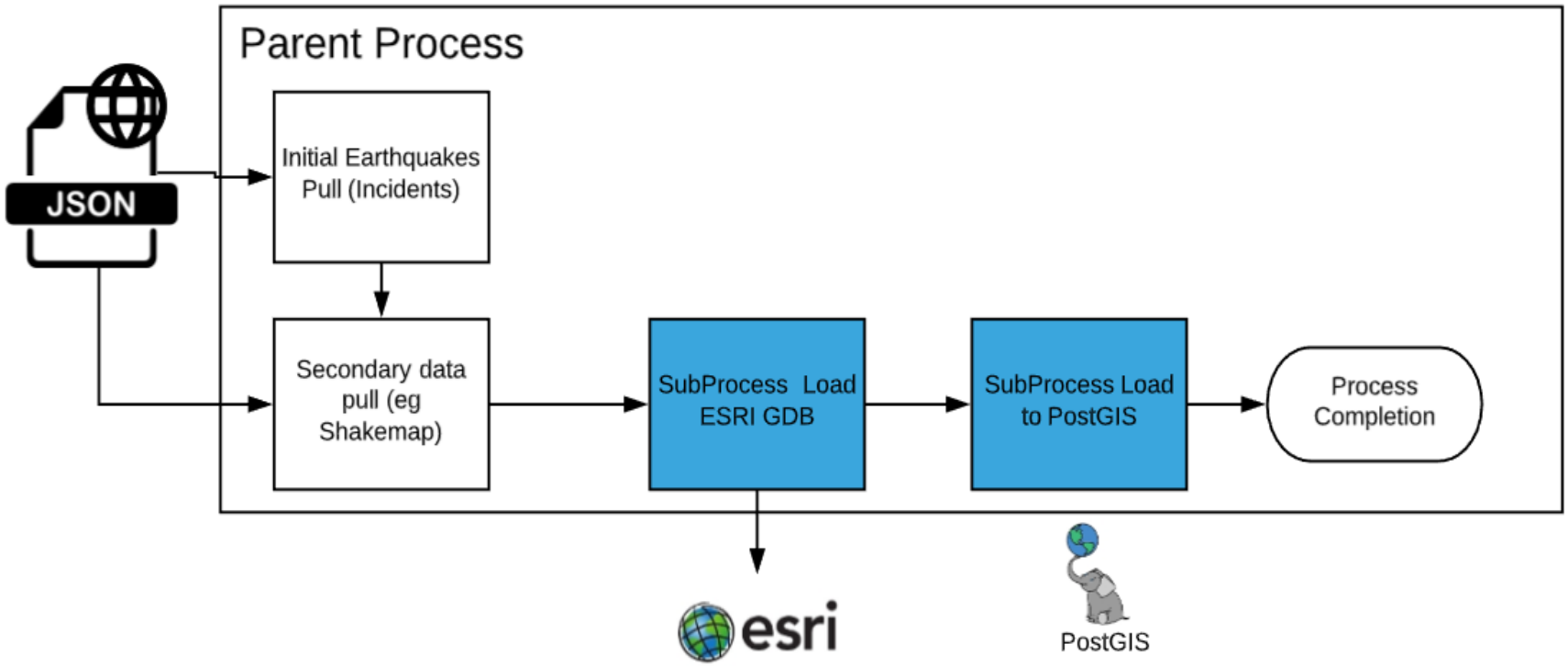
New file?

Updated file?

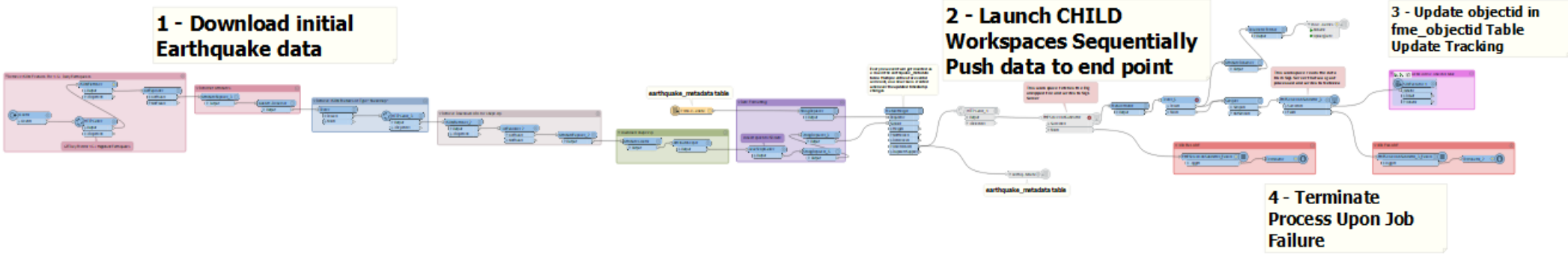
Development Considerations

1) Structure of the data
2) Timeliness of the process
3) Reporting and Trapping Errors

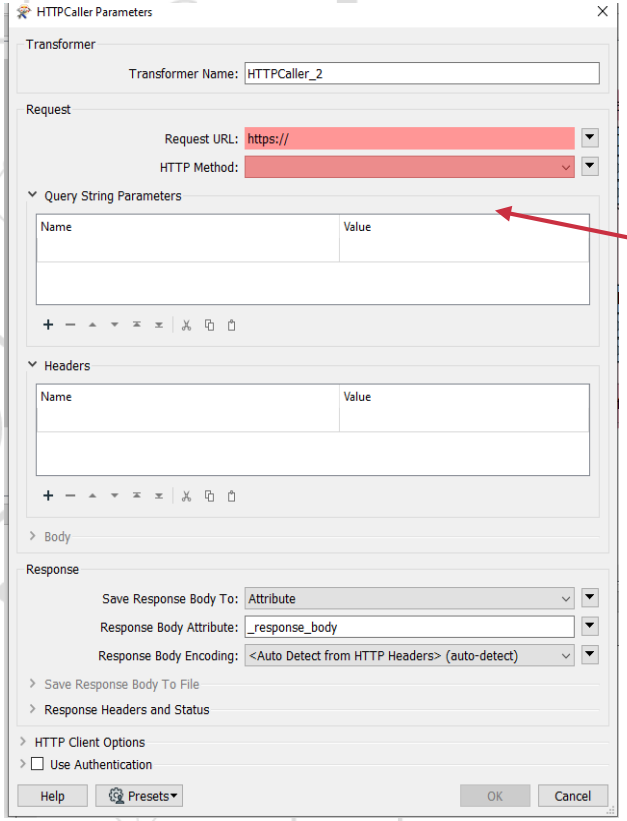
Typical Process Steps Breakdown

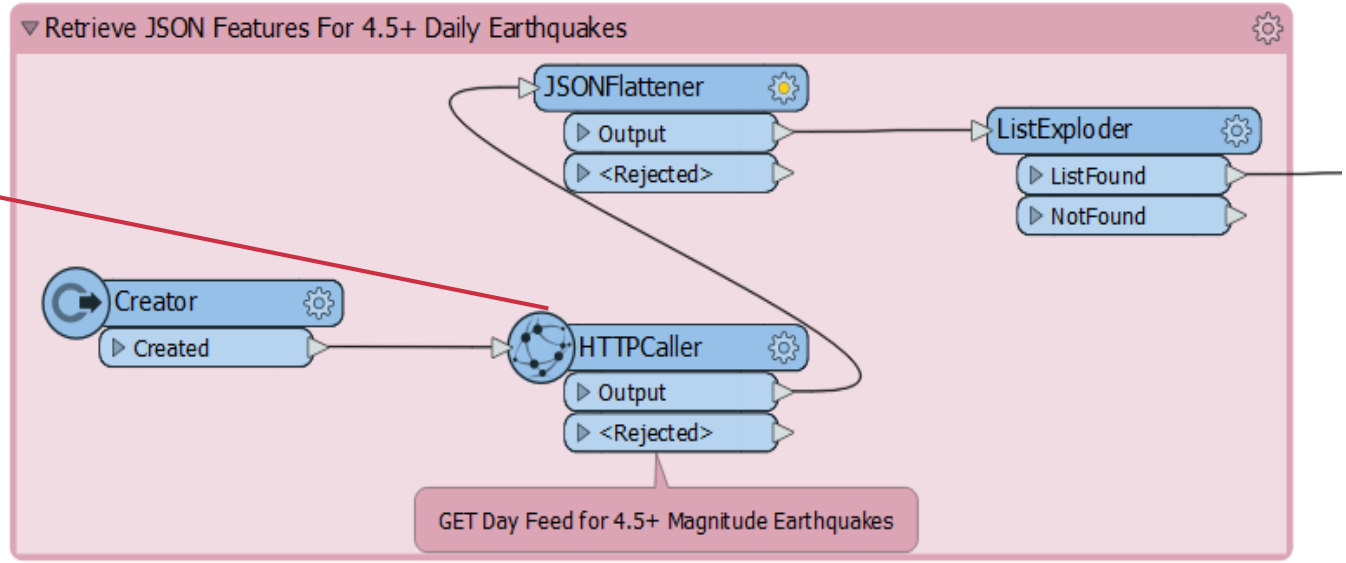


Pulling data from a REST Service



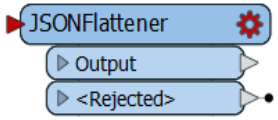
Key Tools: HTTPCaller



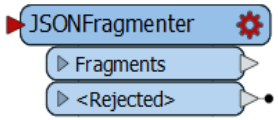


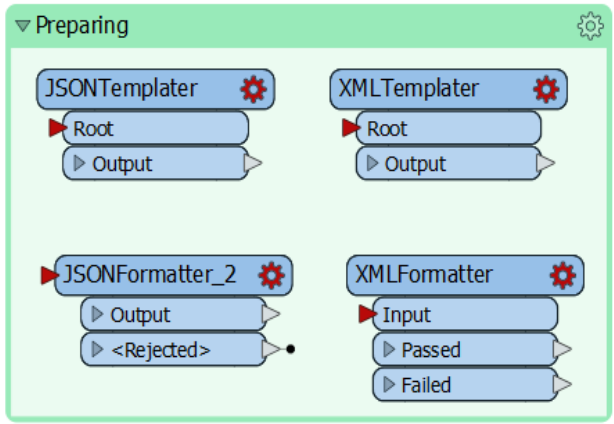
Key Tools: JSON and XML

Break JSON into Attributes

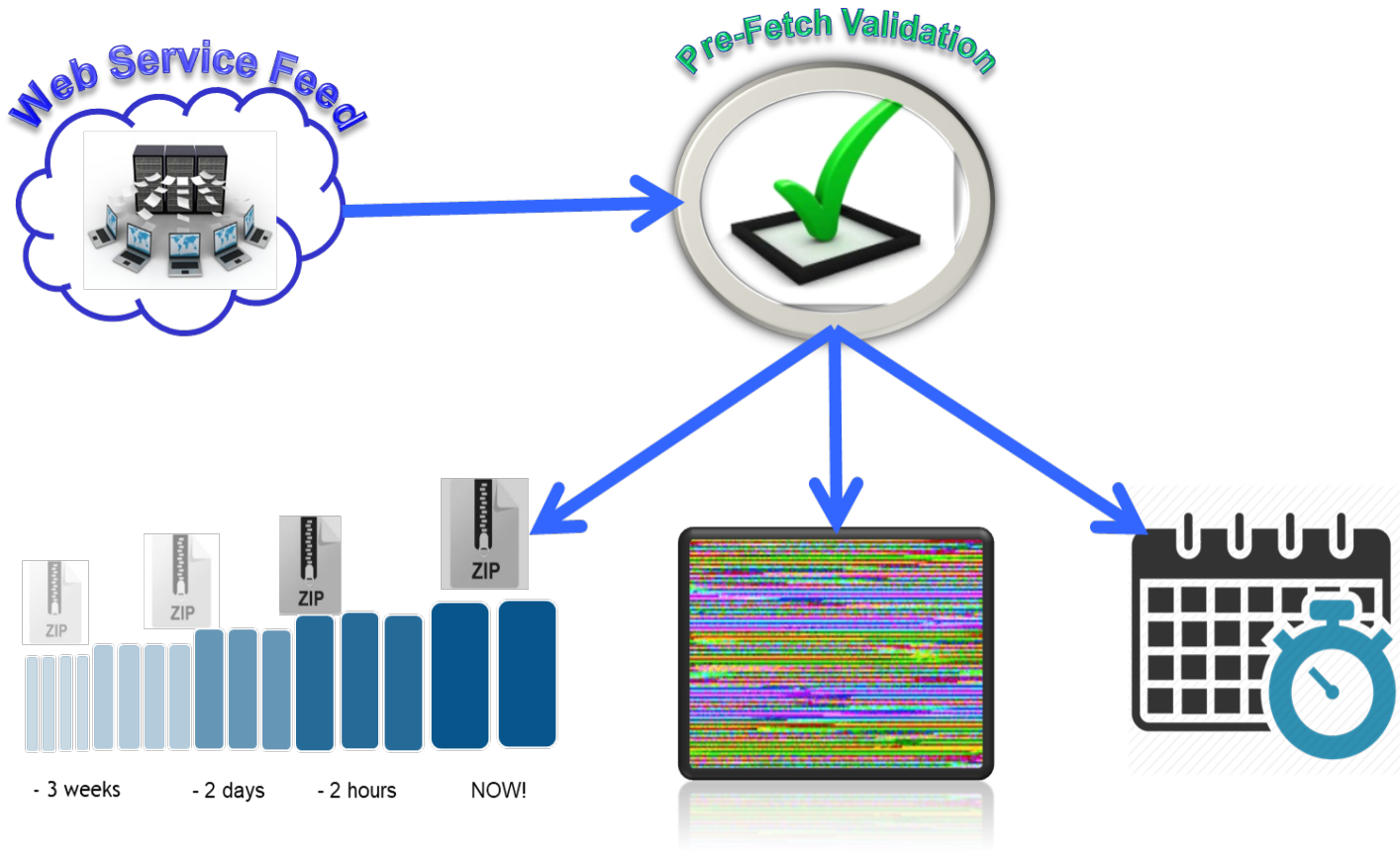


Break JSON into Seperate Records

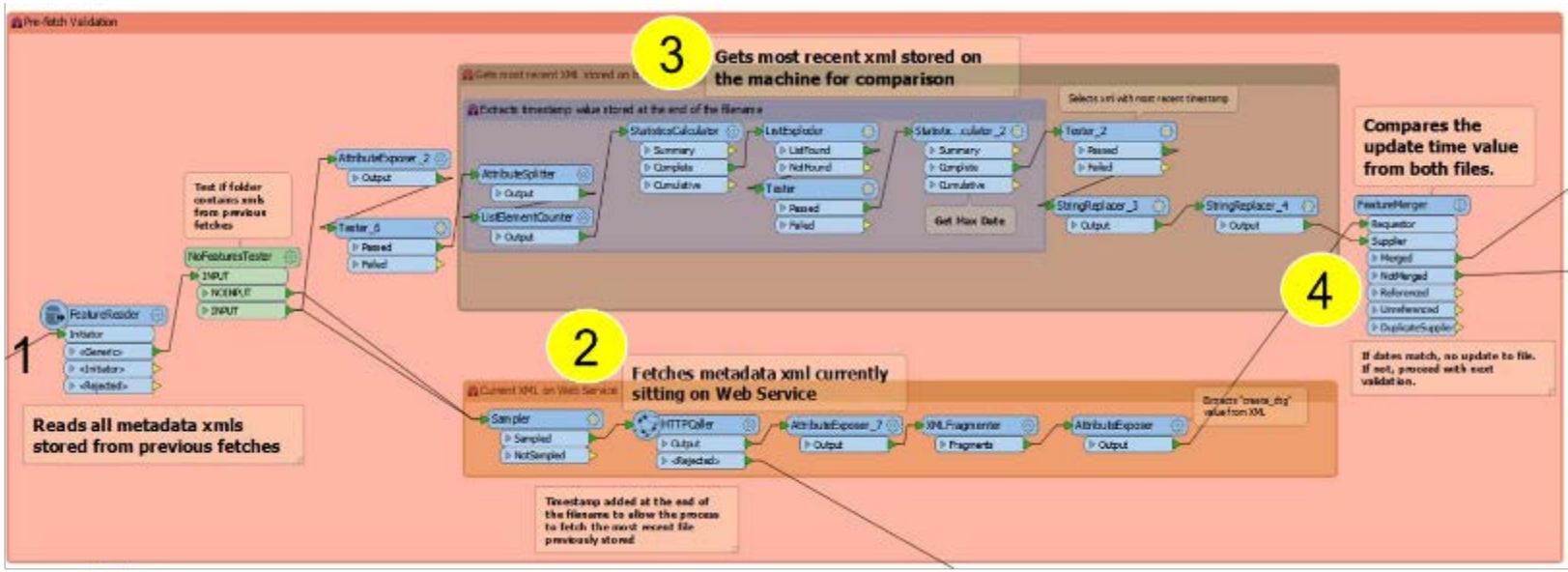




Pre-fetch Validation

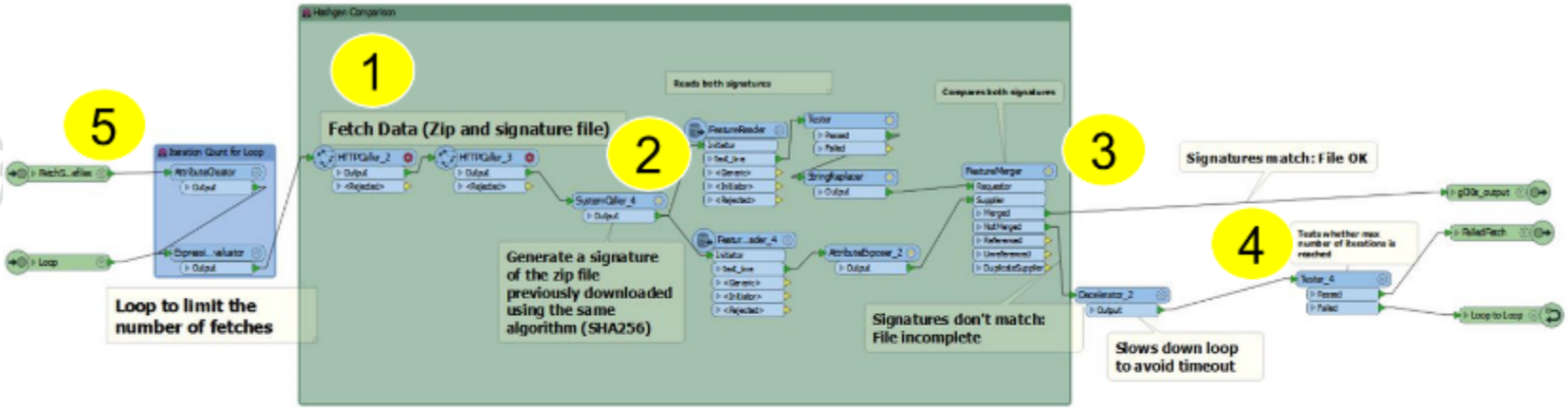


Technical Challenges: Figuring out which data to retrieve



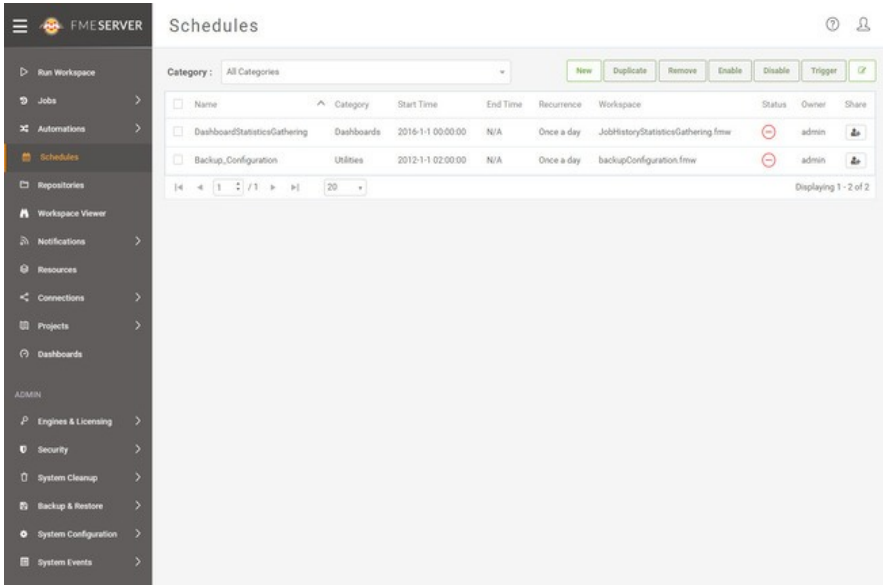
1. Read previous xmls
2. Fetches the new metadata
3. Find the most recent previous file
4. Compare the updates

Technical Challenges: Validating the Download



1. Fetch data
2. Generate signature of new file
3. Compare the signatures
4. If match fails : loop back the file
5. Try download again

Automation with FME Server



- Hurricane – 24 API calls/day (Hourly)
- Earthquake – 48 API calls/day (Every 30 mins)
- Wildfires MODIS – 24 API calls/day (Hourly)
- Wildfires GeoMAC – 24 API calls/day (Hourly)
- LSR(Hail,Wind,Tornado) – 24 API calls/day (Hourly)
- Severe Weather – 23K API calls/day (Hourly)
- UK Floods – 96 API calls/day (Every 15 mins)
- European Winterstorm – 24 API calls/day (Hourly)

Conclusion

- FME helped in integrating real-time data in reliable way
- Planning for automation of new perils like ice, snow, Canada Wildfires
- Integrating new API services
- Migrating to FME cloud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Consortech®