Real-Time and Big Data Analysis with ArcGIS Velocity

Jay Fowler

Esri Southeast User Conference

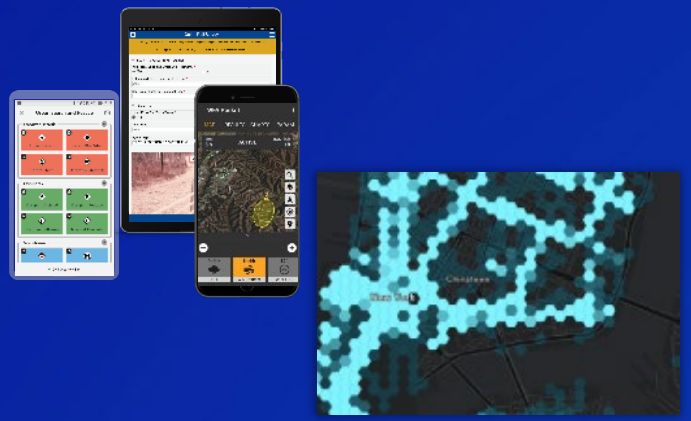
welcome

to the

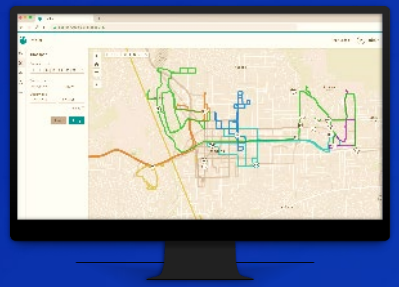
connected world

The Velocity of Mission Critical Real Time Data Is Increasing

Personnel Tracking

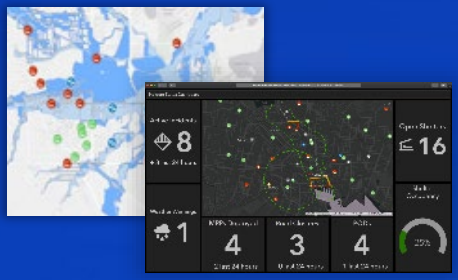


Resource Optimization



Asset & Entity Tracking

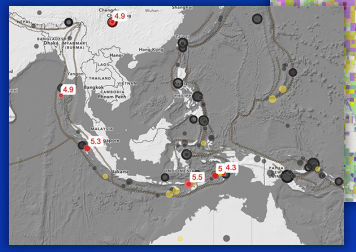
Infrastructure Protection



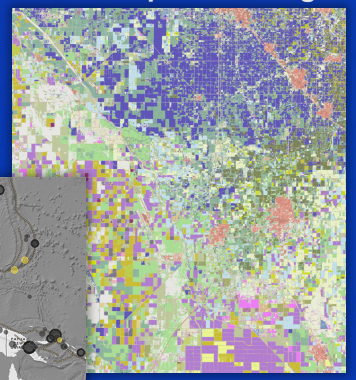
Operations Monitoring

SCADA Integration

Anomaly Detection



Soil & Crop Monitoring



Air Quality Monitoring

Connected Cars

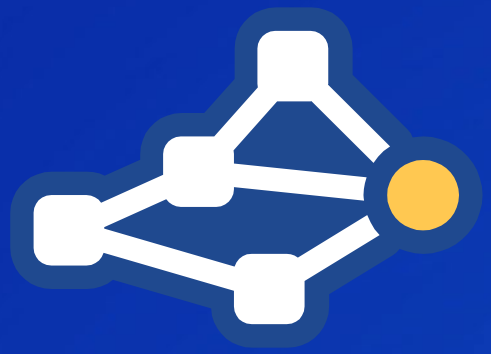
Key Challenges in Meeting Real-Time Data Needs

Data is high volume, complex and noisy

ArcGIS Velocity delivers a complete solution

Managing and analyzing high volume and velocity data in support of mission critical applications in spatial context

Ingest



Analyze

Alert

Act/Adapt

ArcGIS Velocity

Real-time and big data capabilities for the ArcGIS Cloud

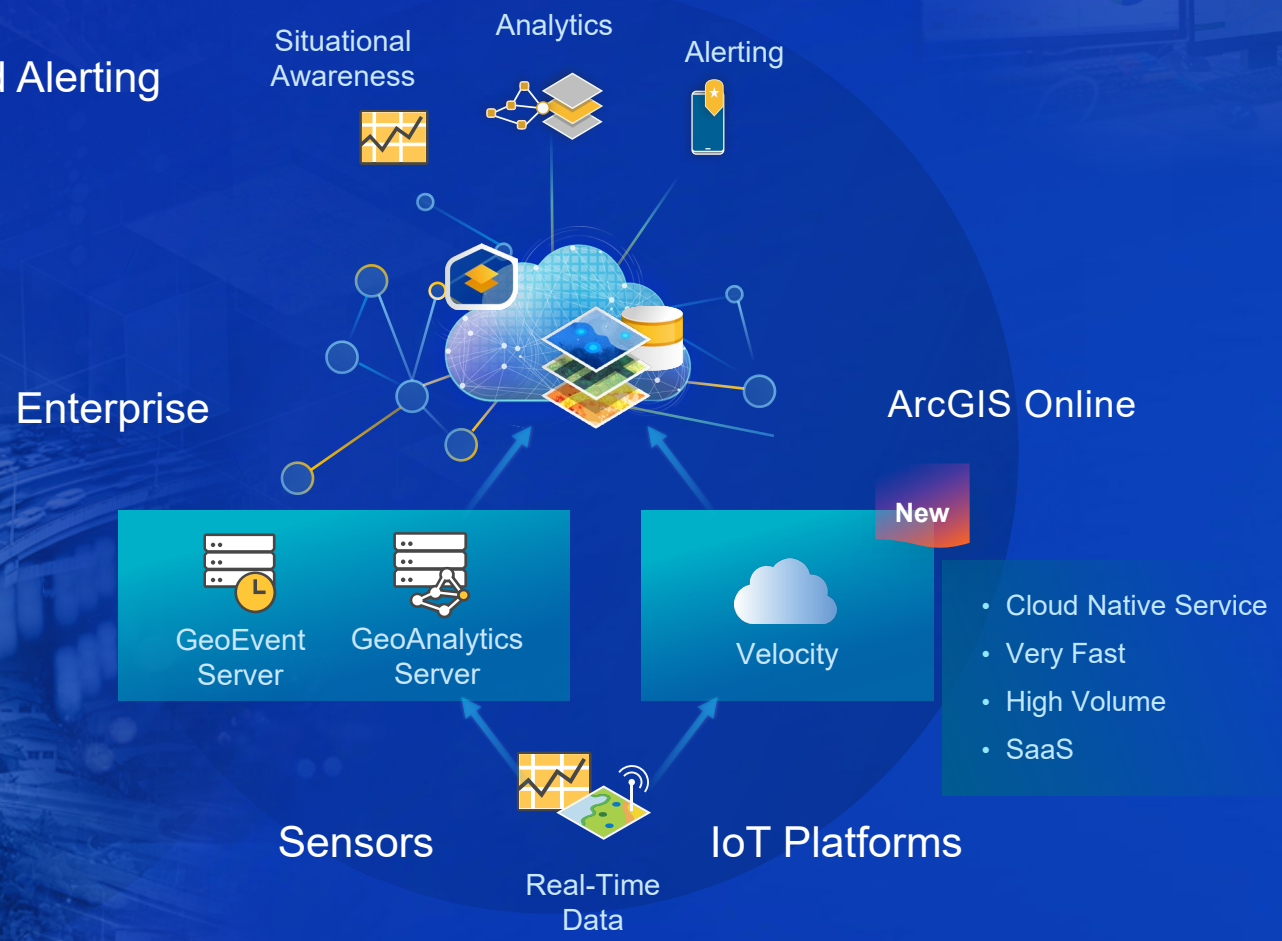
- Capabilities
  - Ingest real-time sensor data
  - Analyze data to detect incidents
    - In real-time
    - In *near* real-time
    - Over time
  - Take action
- Scalable
- Resilient

Real-Time Visualization & Analytics

Integrating Sensor Networks and IoT

Supporting High-Velocity Data Streams

Tracking, Monitoring and Alerting



Collapsing the Time from Measurement to Decision Making

Ingest & Visualize Real-Time Streaming Data

Configure feeds that connect to real-time information from multiple networks or IoT data sources

Analyze Data In Real-Time

Process individual observations as they are ingested

Push Automated Actions & Alerts

Trigger alerts and actuate devices under specific conditions

Perform Batch Analysis on Stored Data

Use big data analytics to gain insights from massive datasets

Disseminate Information & Findings

Share your analysis results with others

ArcGIS Velocity

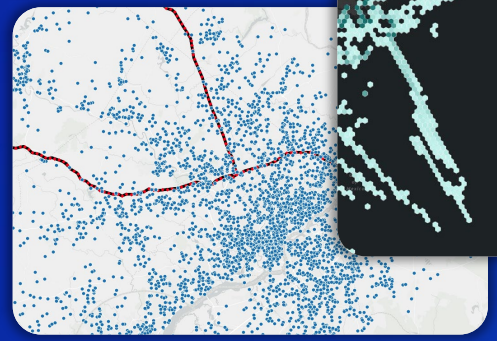
Capabilities for…

Feeds

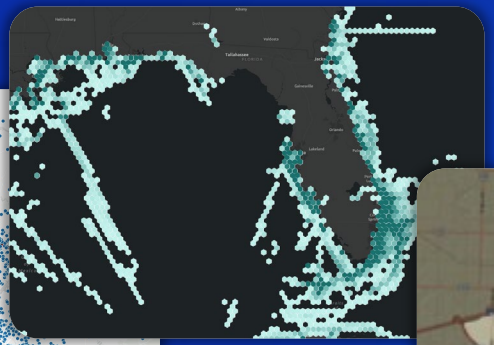
Real-Time Analytics

Big Data Analytics

Ingestion



Visualization



Geofencing

Incident Detection

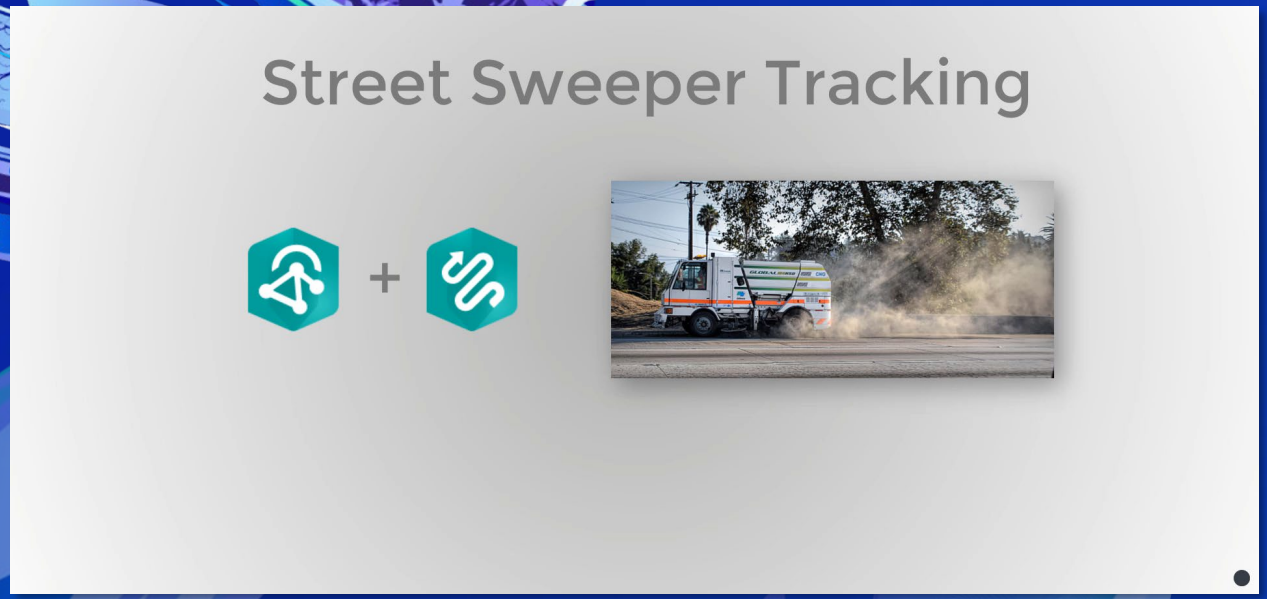
Trend Analysis

Alerting

Personnel Tracking & Analytics

Infrastructure Monitoring

Asset & Fleet Tracking

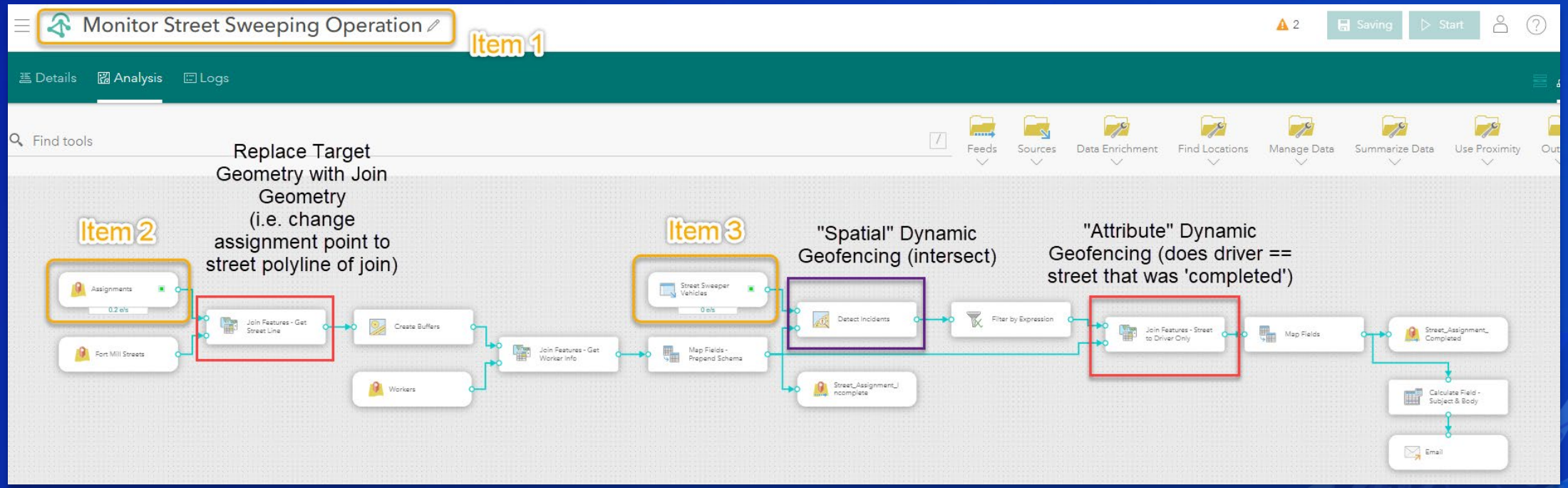


Street Sweeping

ArcGIS Velocity

ArcGIS Velocity Evolution

Street Sweeping Continued



How ArcGIS Velocity Works

ArcGIS Velocity

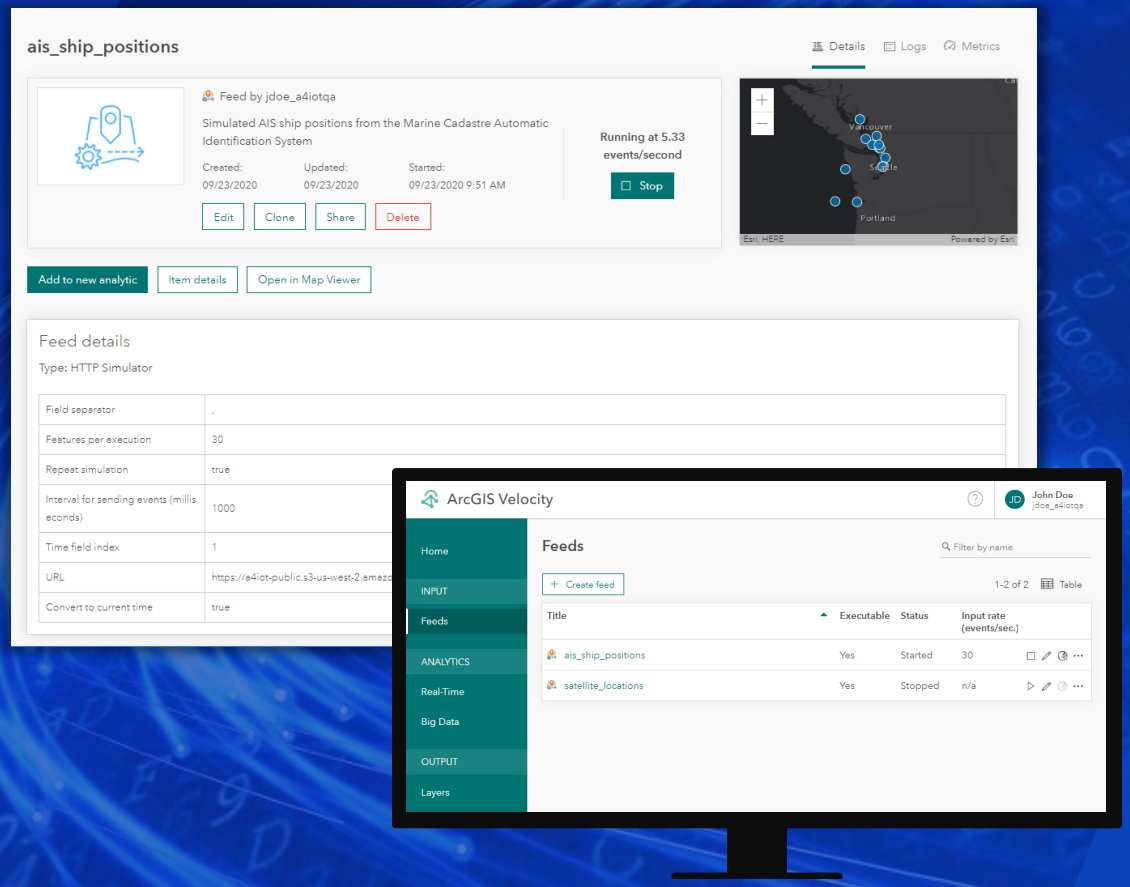
Leverage sensor and IoT data for geospatial reasoning

…connects to industry leading cloud IoT platforms, data lakes, and sensor vendor APIs

Feeds

Ingest and visualize real-time data streams

- **Connect to data sources**
  - **ArcGIS (Feature & Stream Layers)**
  - **Cloud IoTs (Amazon, Azure, Cisco)**
  - **Web & Messaging (HTTP, Kafka, RSS…)**
- **Schema auto-discovery**
- **Behaves like a stream layer**
- **Immediate display of new data**

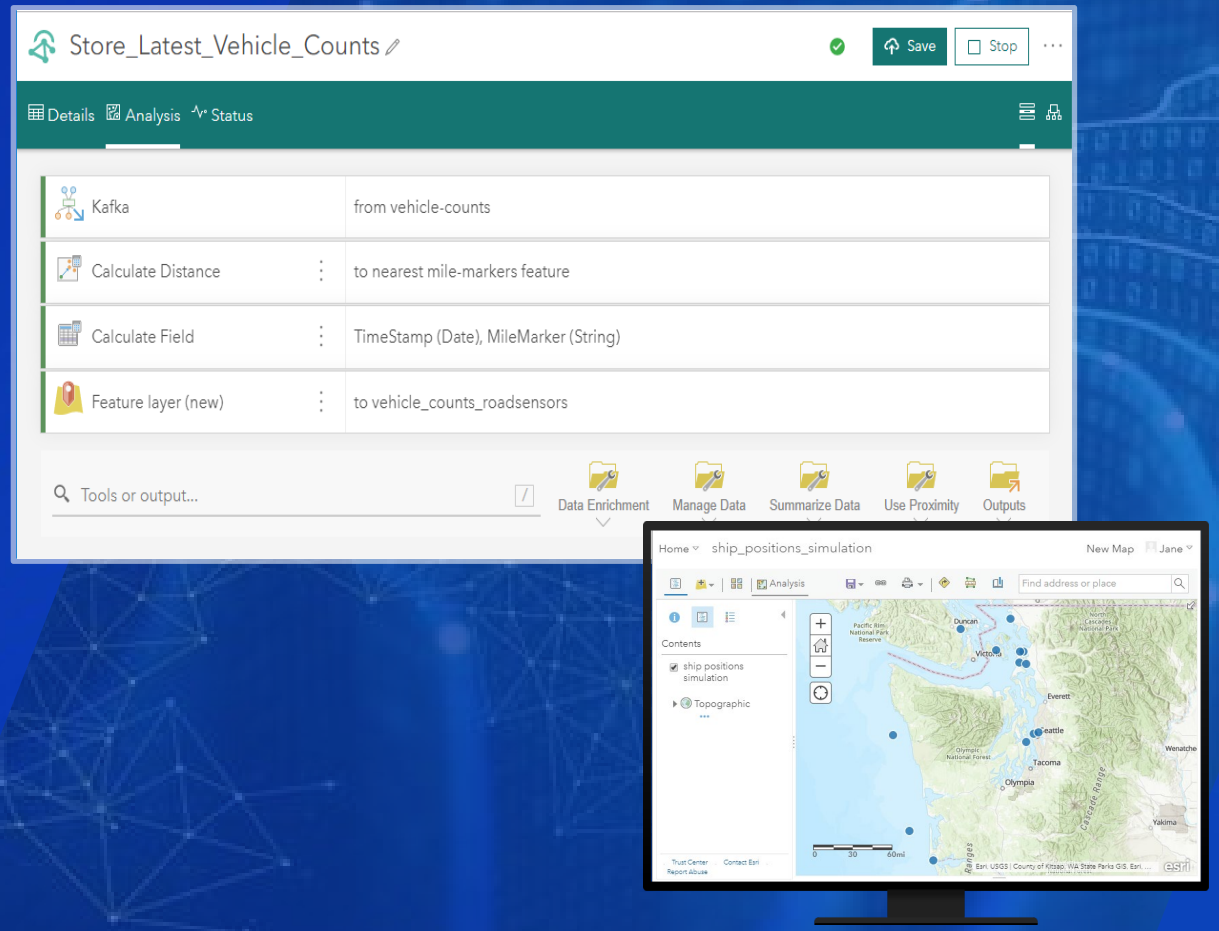


…discover and share real-time data streams as items in ArcGIS

Real-Time Analytics

Process and analyze real-time data streams

- **Input Sources**
  - **Feeds (one or more)**
  - **Static data sources (enrichment, joins)**
- **Analytic Tools**
  - **Build a pipeline of zero to many….**
  - **Analyze individual observations**
- **Outputs**
  - **ArcGIS Layers (Map & Feature)**
  - **Alerts & Notifications (Email, Actuations)**

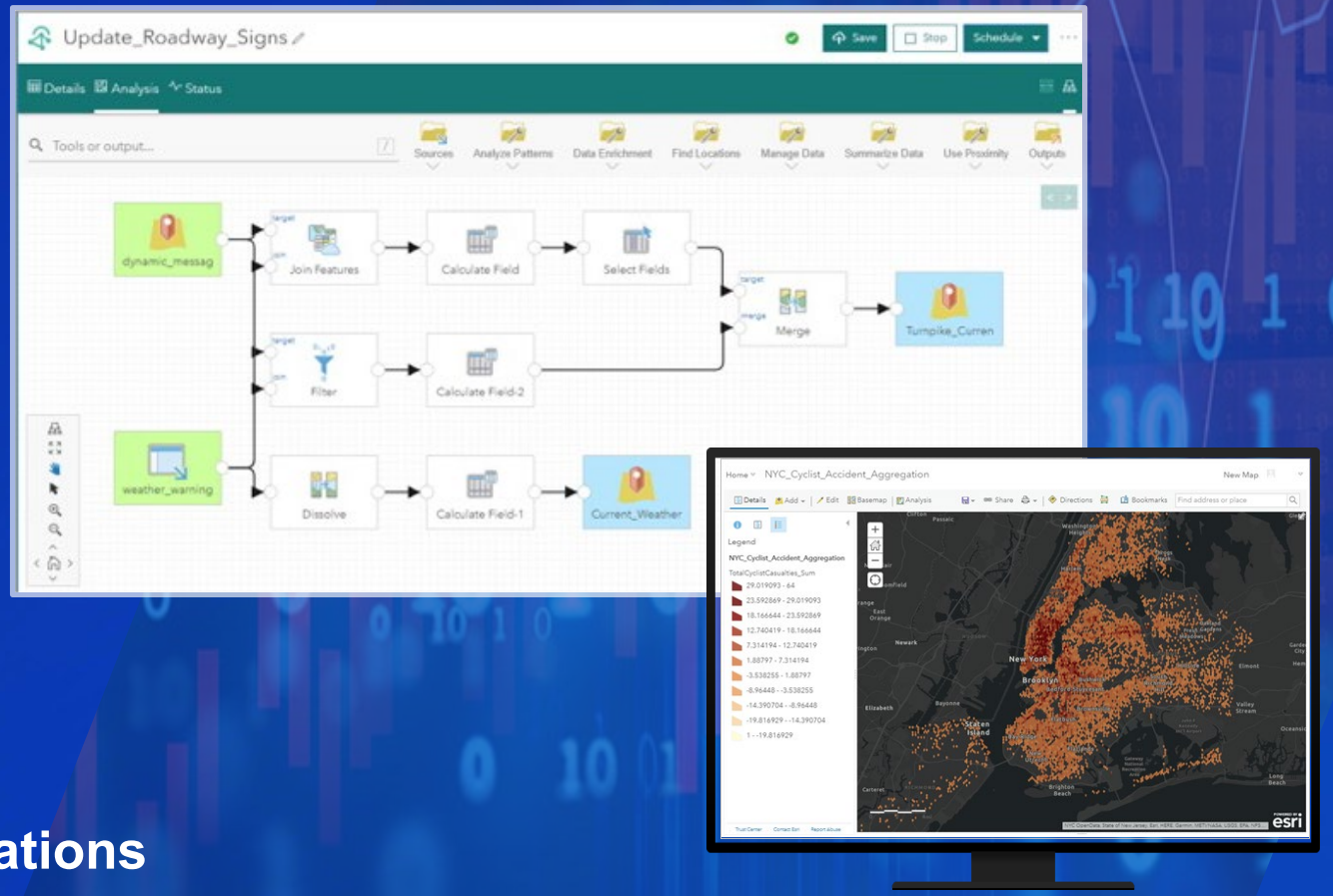


…generating alerts from and triggering actions to IoT devices in real-time

Big Data Analytics

Perform batch analysis on stored big data

- **Input Sources**
  - ArcGIS (Feature Layers)
  - Cloud (Amazon S3, Azure Blob)
  - Web & Messaging (HTTP, RSS…)
- **Analytic Tools**
  - Analyze Patterns
  - Find Locations
  - Manage, Summarize, Enrich Data
- **Output results to one or more destinations**



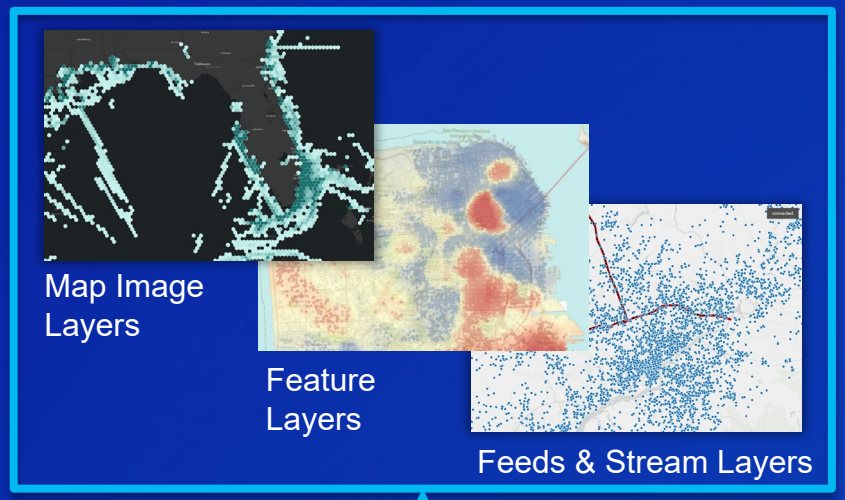
…big data analysis pipelines on demand or scheduled for recurring execution

How to get Started with ArcGIS Velocity

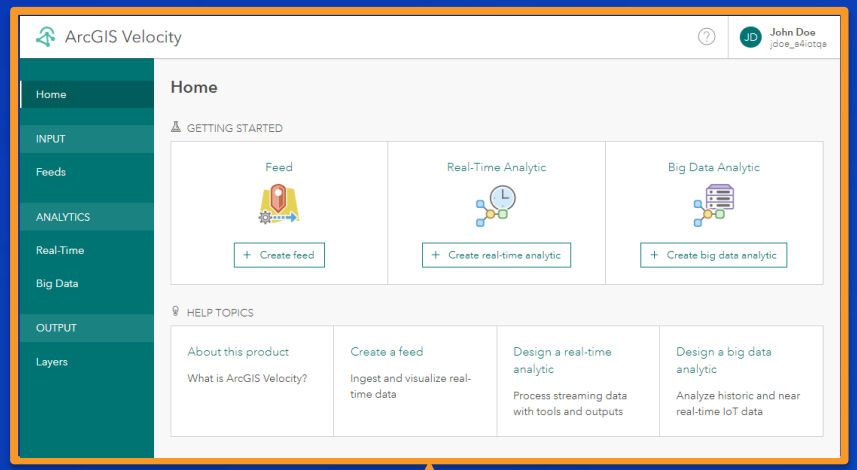
Licensing

An annual subscription on top of ArcGIS Online

Layers & Feeds - available to all users



App –Creators and GIS Pros



…follows the same business rules and policies of ArcGIS Online

License Levels

Functionality Comparison

	Standard	Advanced	Dedicated
Feeds	✓	✓	✓
Real-Time Analytics	✓	✓	✓
Big Data Analytics (ad hoc)	✓	✓	✓
Big Data Analytics (scheduled)		✓	✓
Big Data Analytics (massive scale)			✓

License Levels

Capacity Comparison

	Standard	Advanced	Dedicated
Velocity	25 KB/s (~100 events/sec)	250 KB/s (~1,000 events/sec)	2500 KB/s and up* (~10,000 events/sec)
Storage	100 GB	1 TB*	3 TB and up*
Running Feeds & Analytics	5	10*	20 and up*

* Subscription can be expanded with add-ons for processing & storage

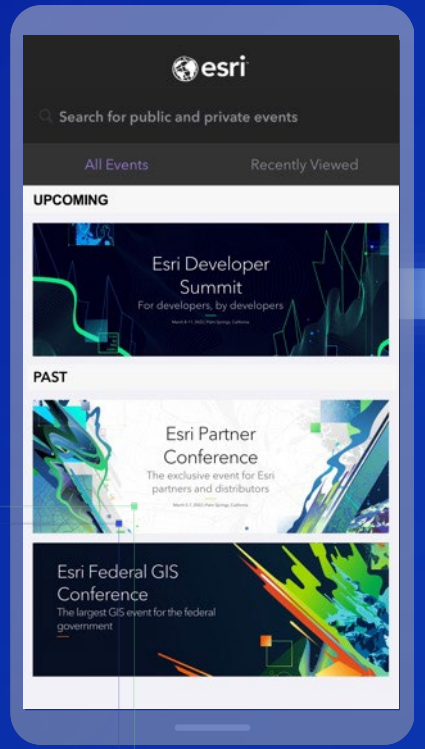
Top 5 reasons to consider SaaS

1. Reduce time to benefit
2. Lower cost
3. Scalability and Integration
4. The provider handles upgrades / new releases
5. Easy to use

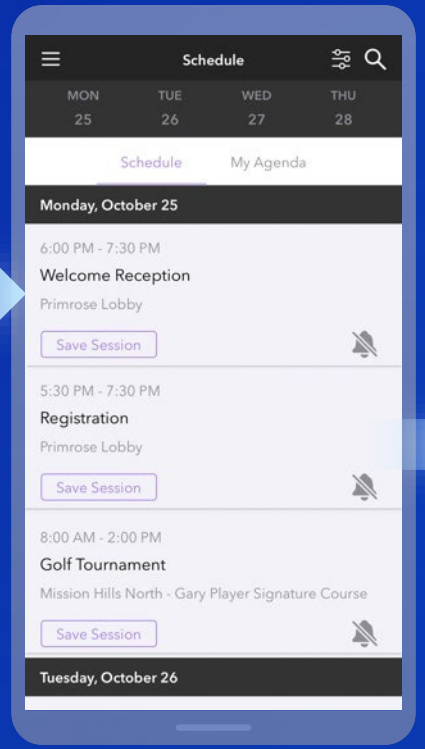
Source: IBM - https://www.ibm.com/cloud/blog/top-5-advantages-of-software-as-a-service

Please Share Your Feedback in the App

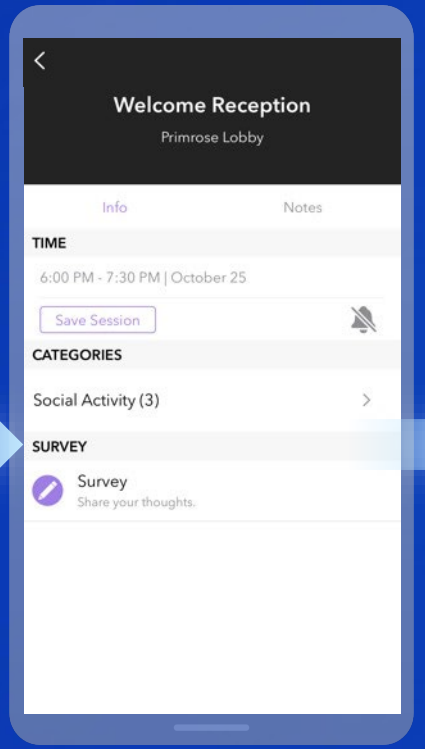
Download the Esri Events app and find your event



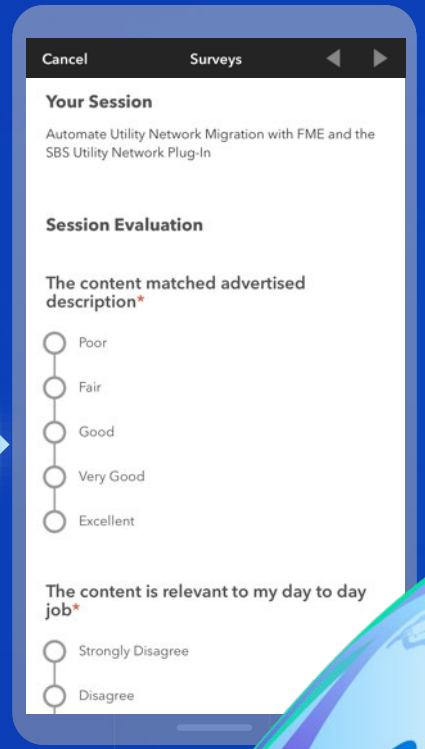
Select the session you attended



Scroll down to “Survey”



Log in to access the survey



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