ArcGIS Analytics for IoT: An Introduction

Suzanne Foss

Ken Gorton

2020 ESRI FEDERAL GIS CONFERENCE | WASHINGTON, D.C.

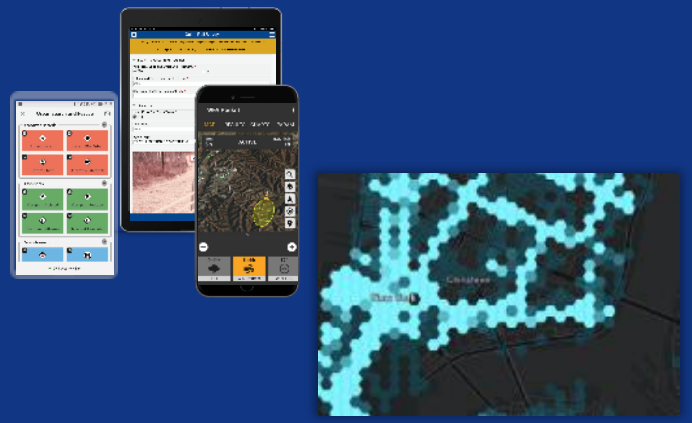
welcome

to the

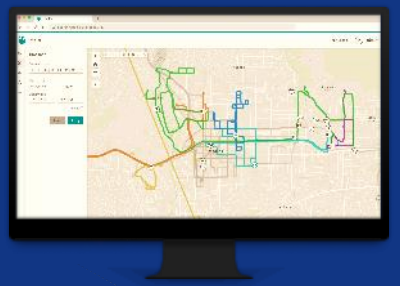
connected world

Geospatial use cases in the internet of things…

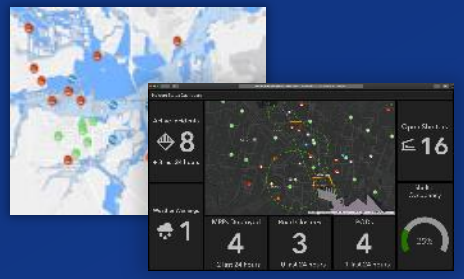
Personnel Tracking



Resource Optimization



Infrastructure Protection

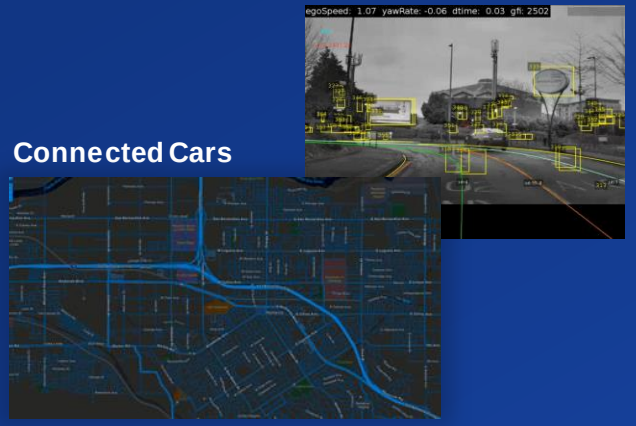


Asset & Entity Tracking

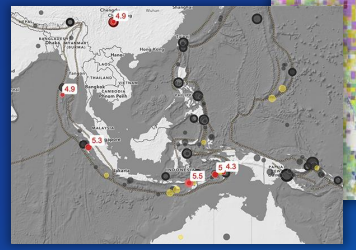
Operations Monitoring

SCADA Integration

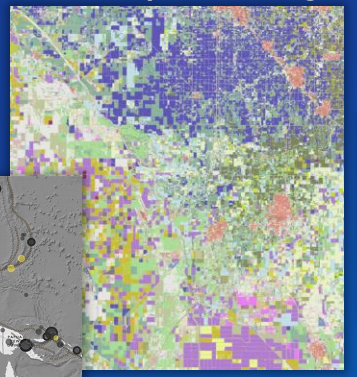
Connected Cars



Anomaly Detection



Soil & Crop Monitoring



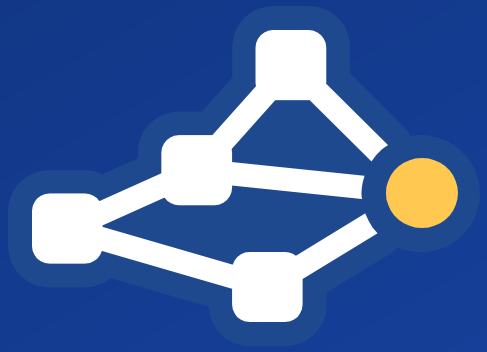
Air Quality Monitoring

Key challenges in meeting needs of IoT use cases

High volume and high velocity data in support of mission critical applications

Ingest

Alert

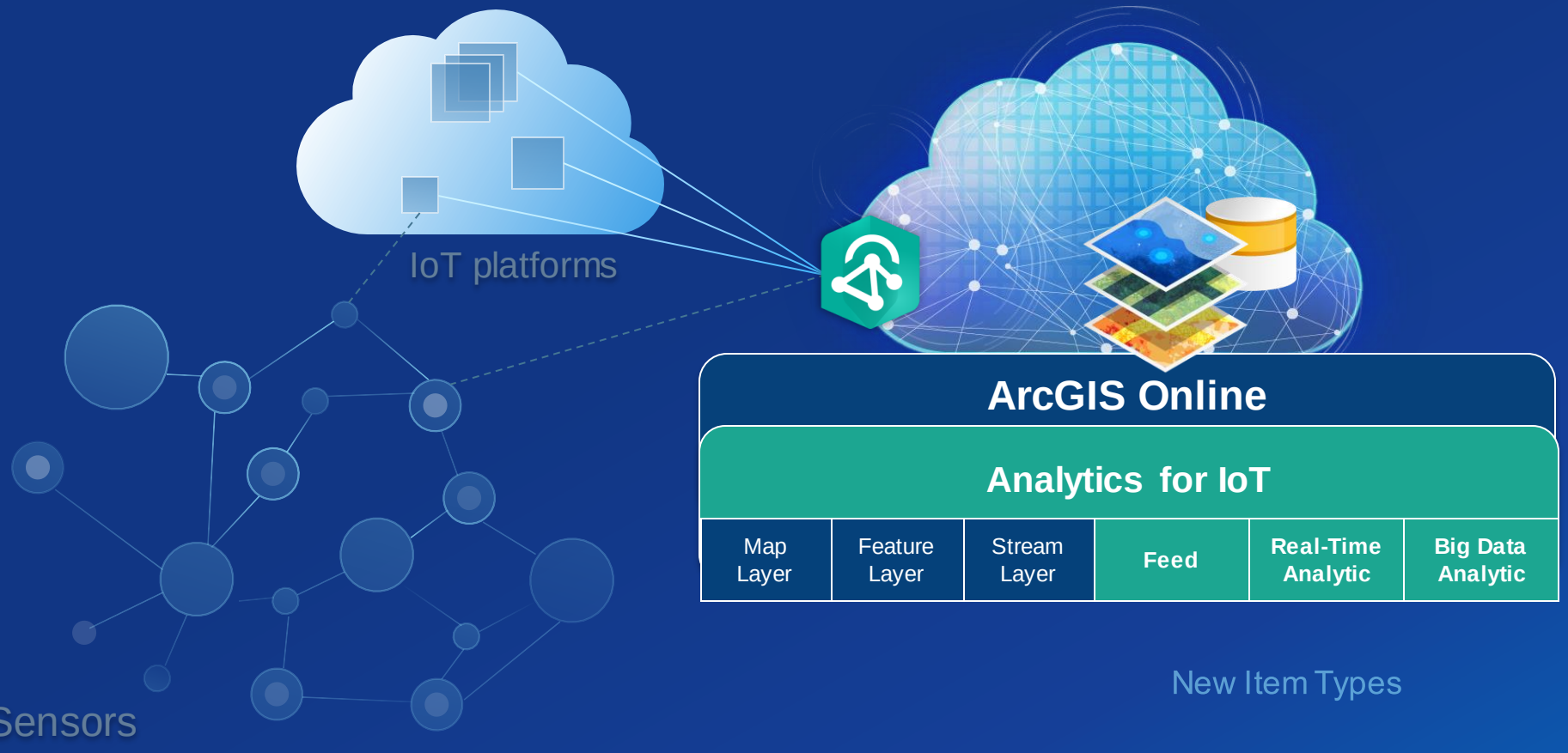


Analyze

…an opportunity to leverage advances in cloud computing and distributed systems technology

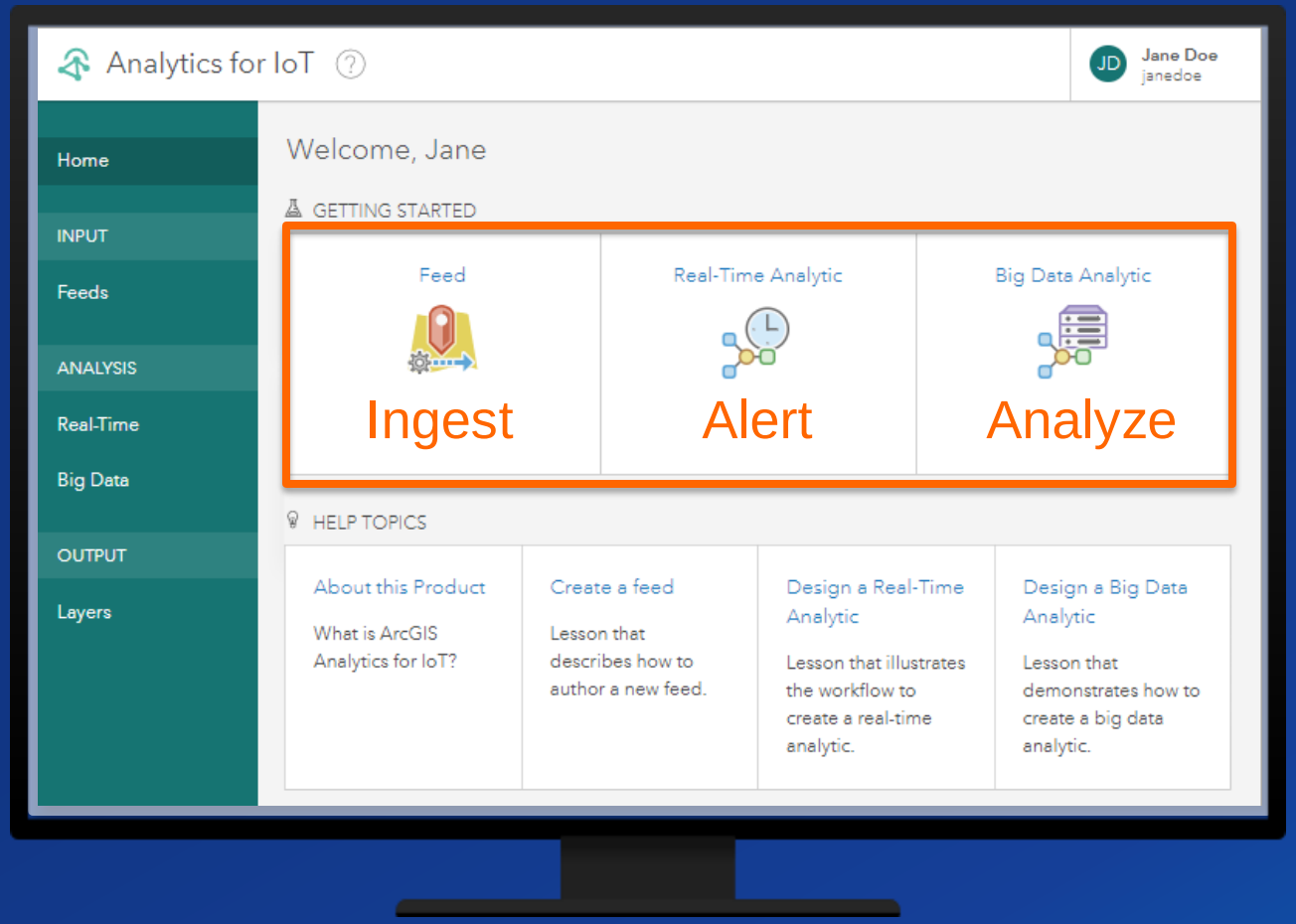
ArcGIS Analytics for IoT

Real-time and big data capabilities for ArcGIS Online

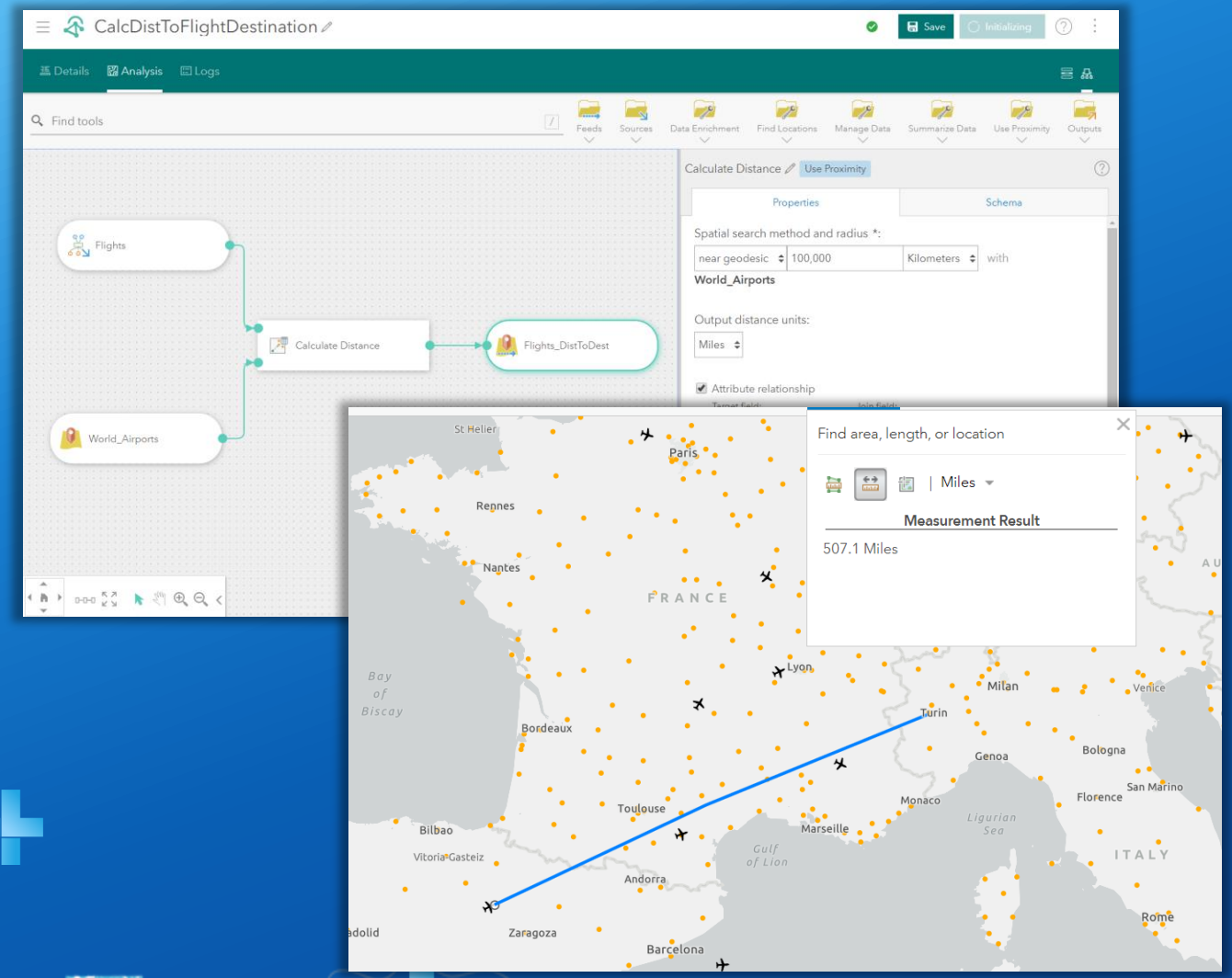


…connects to industry leading cloud IoT platforms, data lakes, and sensor vendor APIs

New Application – ArcGIS Analytics for IoT



…ingest, process, and analyze your real-time data with ArcGIS Online



Real-time data ingestion & analysis

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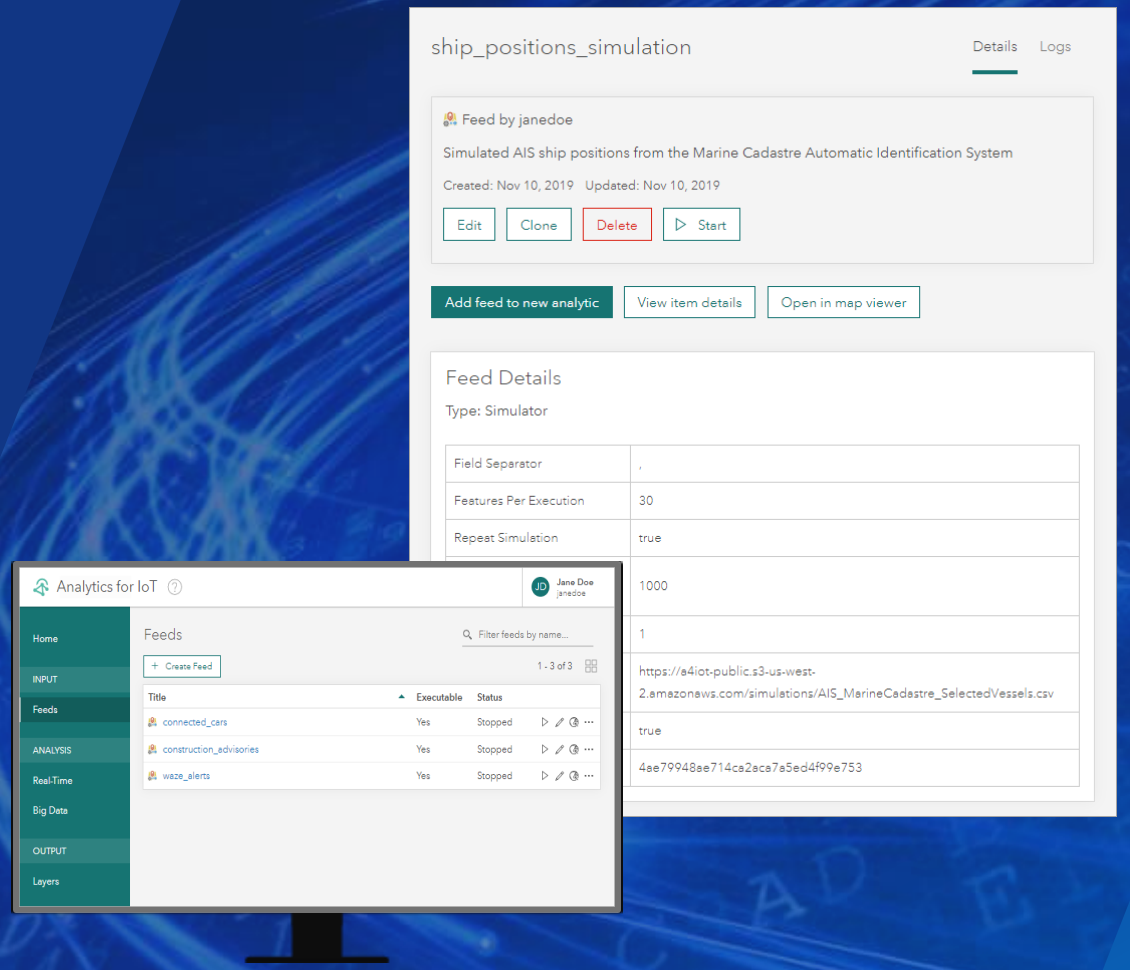
Feeds

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**

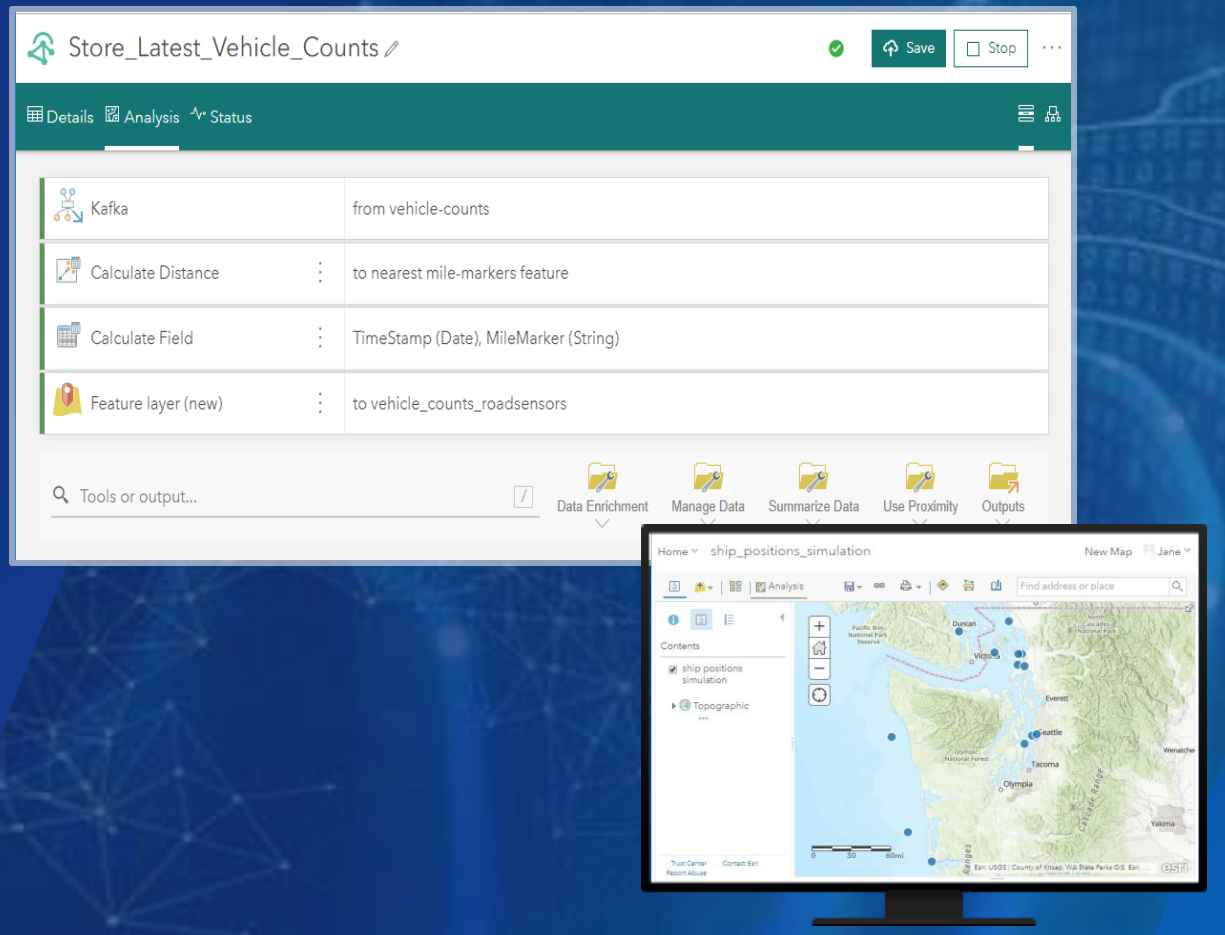


…discover and share real-time data streams as items in ArcGIS

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

Input & output types

Supported types and formats

Feeds

- Feature Layer
- Stream Layer
- Azure IoT Hub
- Azure Service Bus
- Cisco Kinetic EFM
- AWS IoT
- Website (Poll)
- Endpoint (Receive)
- RabbitMQ
- MQTT
- Web Socket
- Kafka Broker
- Simulator

Sources

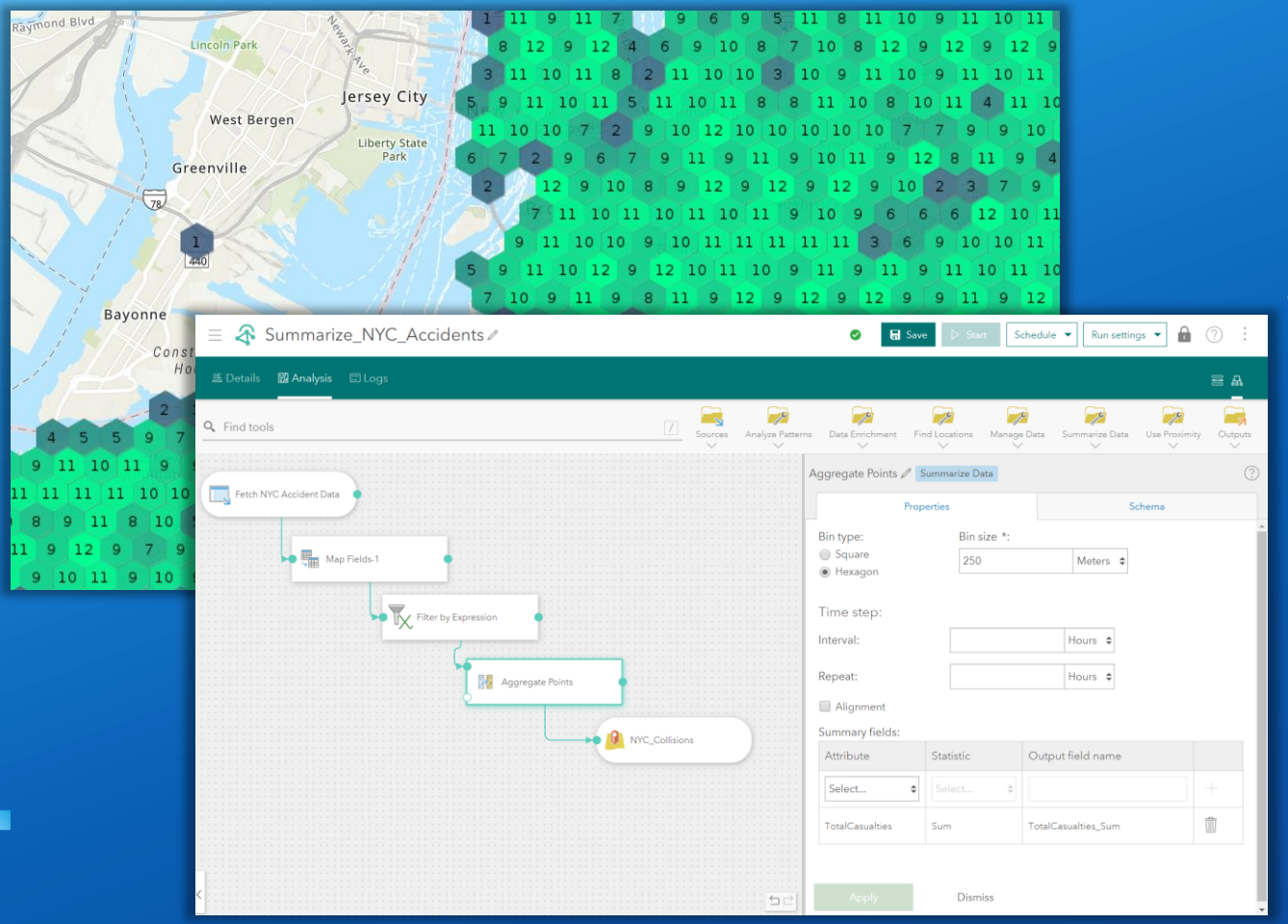
- Feature Layer
- Amazon S3
- Azure Blob
- Website (Poll)

Outputs

- Feature Layer
- Stream Layer
- Amazon S3
- Azure Blob
- Azure IoT Hub
- RabbitMQ
- Email

Formats

- Delimited Text
- EsriJSON
- GeoJSON
- JSON
- RSS
- Parquet
- Shapefile



Big data analytics

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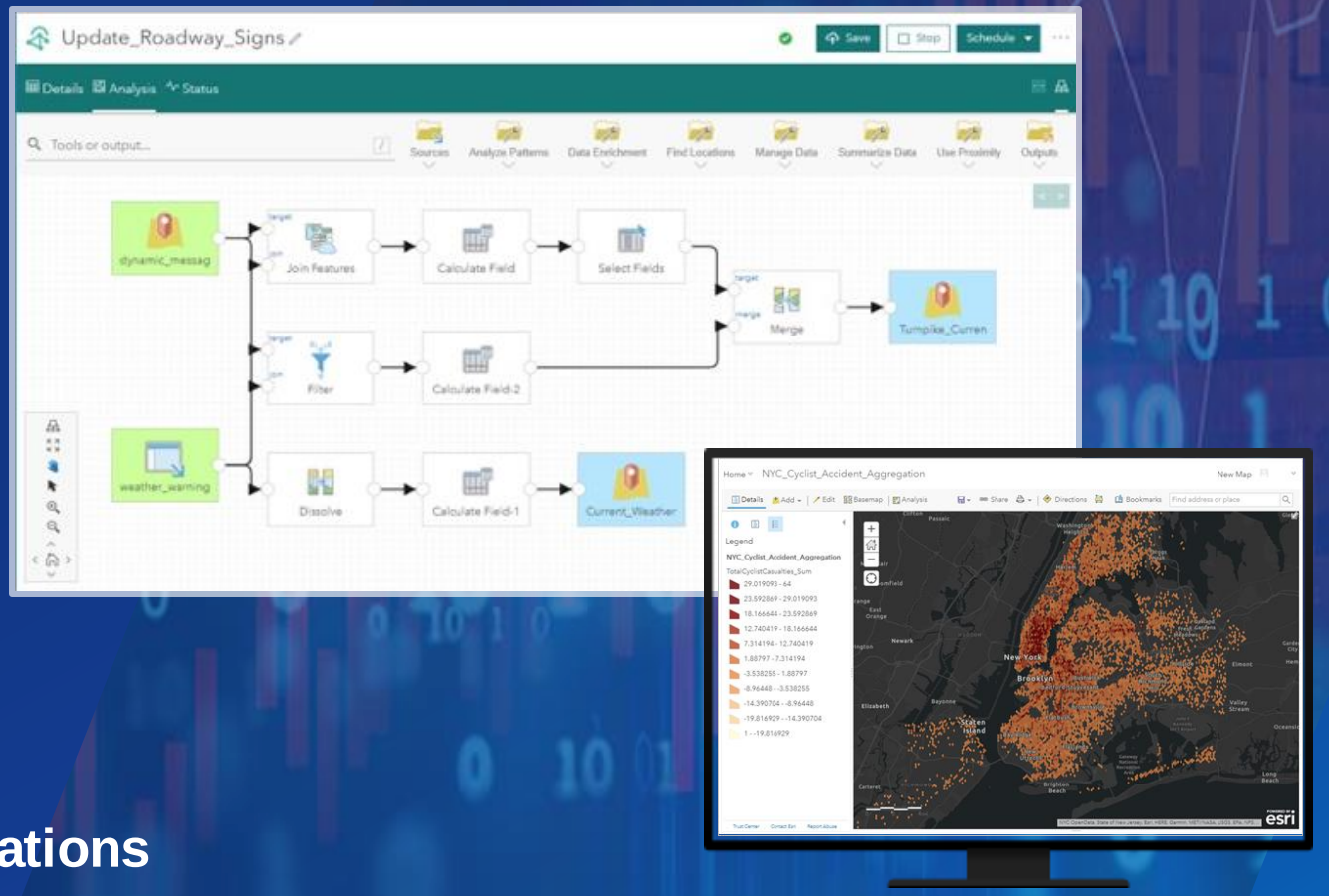
Big Data Analytics

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

Spatiotemporal analysis

Summarize Data

- Aggregate Points
- Join Features
- Reconstruct Tracks
- Summarize Attributes
- Summarize Within

Find Locations

- Detect Incidents

Enrich Data

- Calculate Motion Statistics

Analyze Patterns

- Calculate Density
- Calculate Journeys
- Find Hot Spots

Use Proximity

- Create Buffers
- Calculate Distance
- Snap to Network

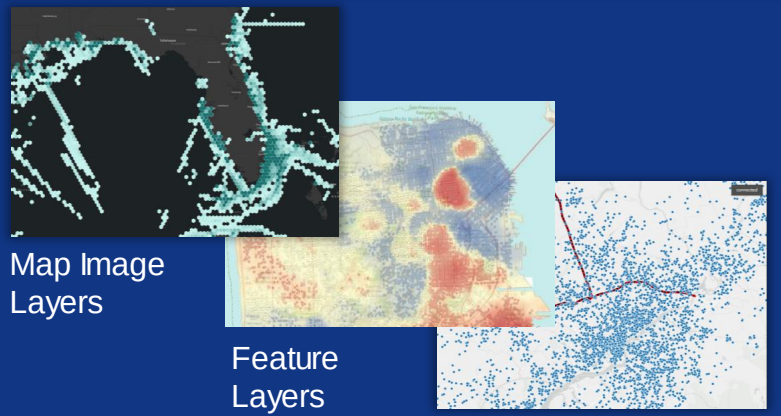
Manage Data

- Calculate Fields
- Filter
- Map Fields
- Select Fields
- Project
- Overlay Layers
- Dissolve Boundaries
- Merge

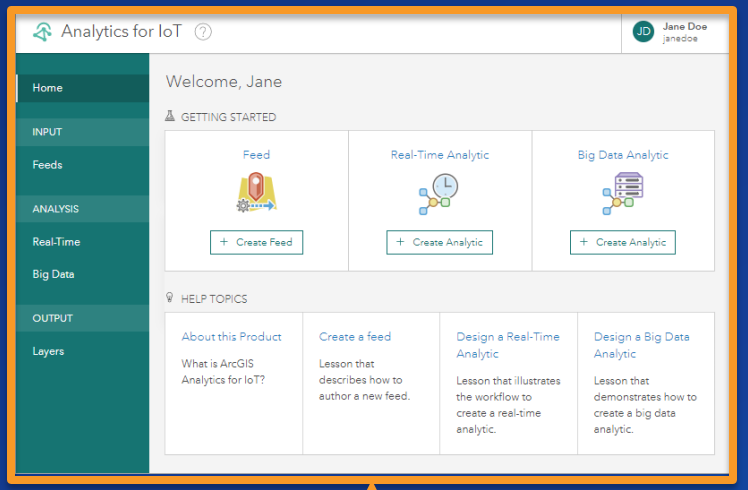
Licensing

An annual subscription on top of ArcGIS Online

Layers & Feeds - available to all users



App –Creators and GIS Pros

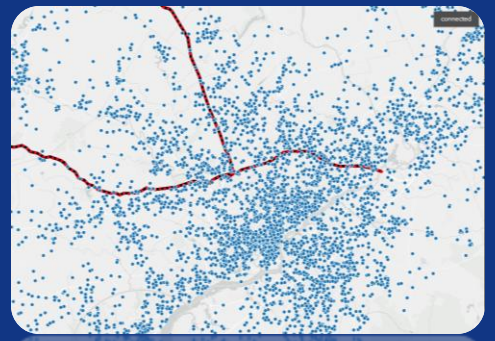


…follows the same business rules and policies of ArcGIS Online

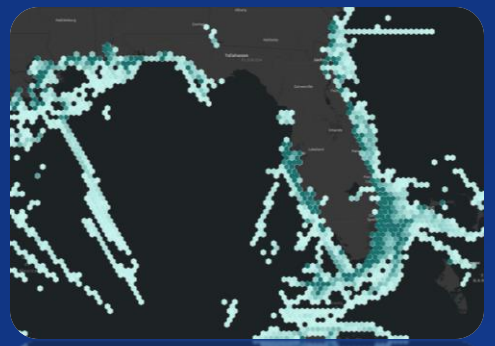
ArcGIS Analytics for IoT

Summary of real-time & big data capabilities

Ingestion

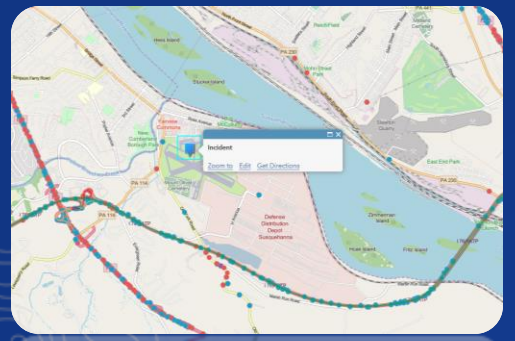


Visualization

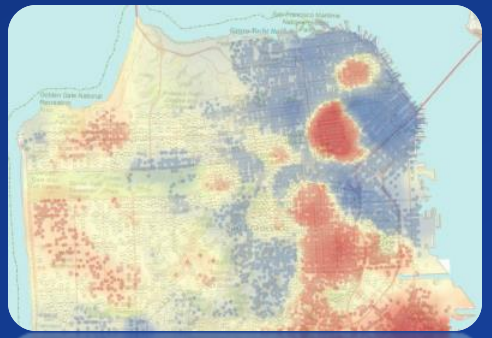


Geofencing

Incident Detection



Trend Analysis



Alerting

Real-Time & Big Data Technical Workshops

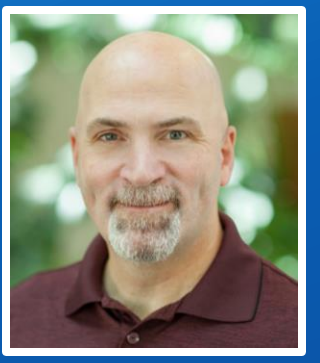
- **Tuesday**
  - 1:45 - 2:45 ArcGIS Analytics for IoT: An Introduction
  - 3:00 - 4:00 ArcGIS GeoEvent Server: An Introduction

- **Wednesday**
  - 11:00 - 12:00 ArcGIS Analytics for IoT: An Introduction — 2nd offering
  - 1:30 - 2:30 ArcGIS GeoEvent Server: An Introduction — 2nd offering
  - 2:45 - 3:45 Real-Time and Big Data GIS: Best Practices — Only Offering
  - 4:00 - 5:00 ArcGIS GeoEvent Server: Applying Real-Time Analytics — Only Offering
  - 5:15 - 6:15 ArcGIS GeoEvent Server: Visualizing Real-Time Data — Only Offering

Questions?

Comments?

Suzanne Foss
ArcGIS Analytics for IoT
Product Manager
sfoss@esri.com



Ken Gorton
ArcGIS Analytics for IoT
Product Engineer
kgorton@esri.com

Adam Mollenkopf
Real-Time & Big Data GIS Capability Lead
amollenkopf@esri.com
@amollenkopf

Print Your Certificate of Attendance

Print Stations Located in 150 Concourse Lobby

Tuesday

12:30 pm – 6:30 pm
Expo
Hall B

5:15 pm – 6:30 pm
Expo Social
Hall B

Wednesday

10:45 am – 5:15 pm
Expo
Hall B

6:30 pm – 9:30 pm
Networking Reception
Smithsonian National Museum of Natural History

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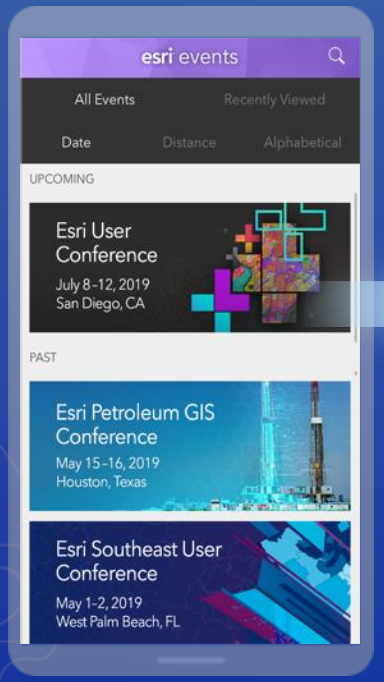
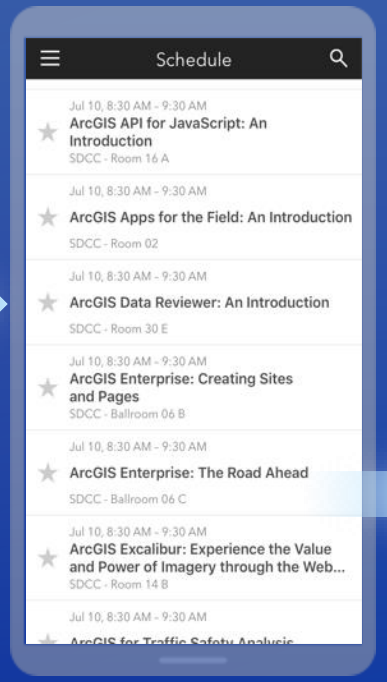
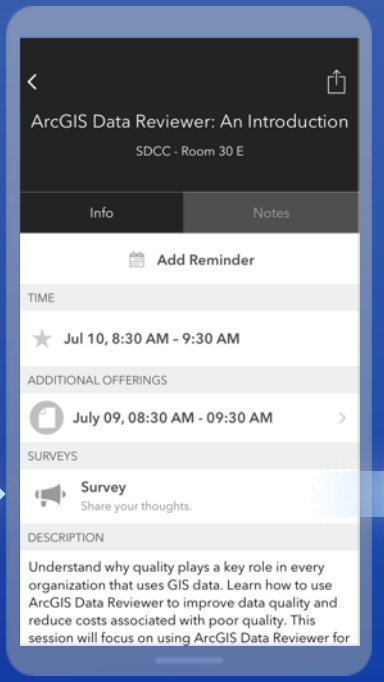


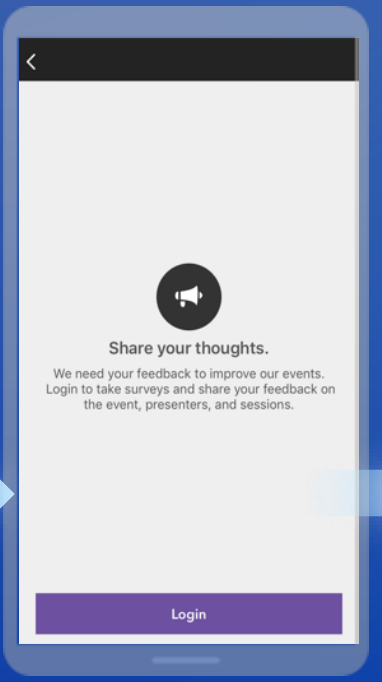
Select the session you attended



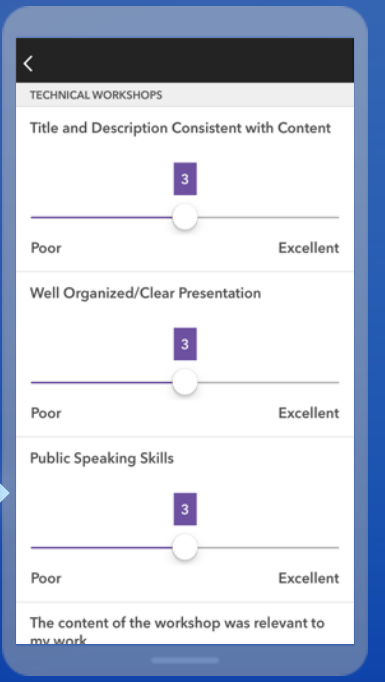
Scroll down to "Survey"



Log in to access the survey



Complete the survey and select "Submit"

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