Building A Real Time Application

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Leveraging Real-Time Capabilities in Building Your App

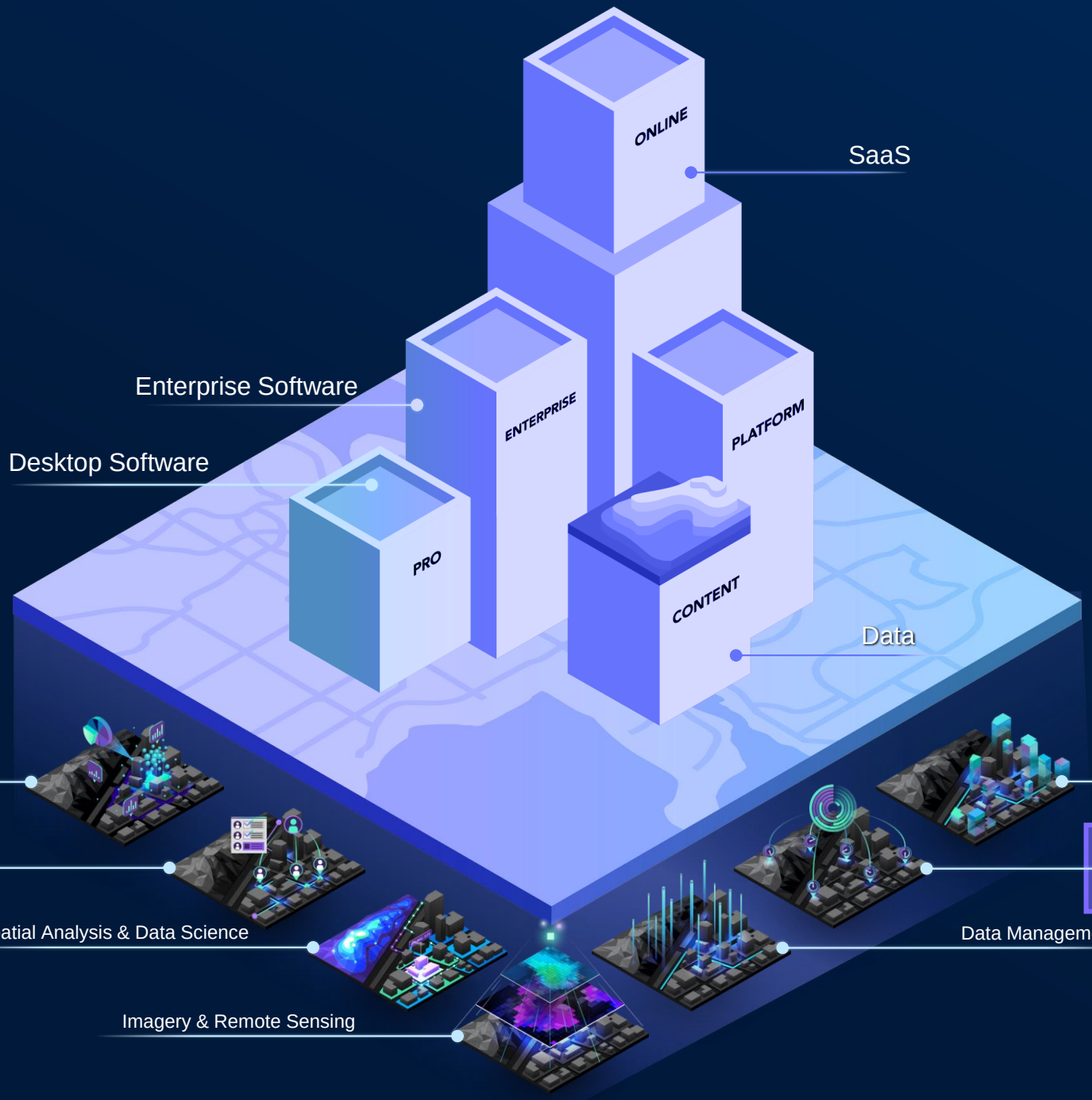
Agenda

- Real-Time Use Cases
- Real-Time Feeds in ArcGIS
- Leveraging Real-Time Feeds in Apps
  - ArcGIS Pro
  - Web Apps
  - Native Apps

Real-Time Use Cases

Overview

Capabilities of a
COMPLETE GIS
& MAPPING SYSTEM



END USER EXPERIENCES

No-Code & Low-Code Builders

StoryMaps
Dashboards
Instant Apps
Experience Builder

Client APIs

Web
Mobile
Desktop

Open-Source
Game Engines
REST

Extending SDKs

Enterprise SDK
Pro SDK

Automation APIs

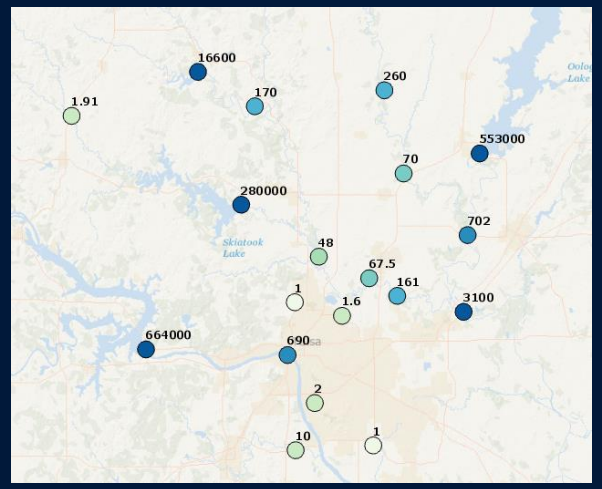
Python API
ArcPy

Real-Time Visualization & Analytics

Real-Time Use Cases

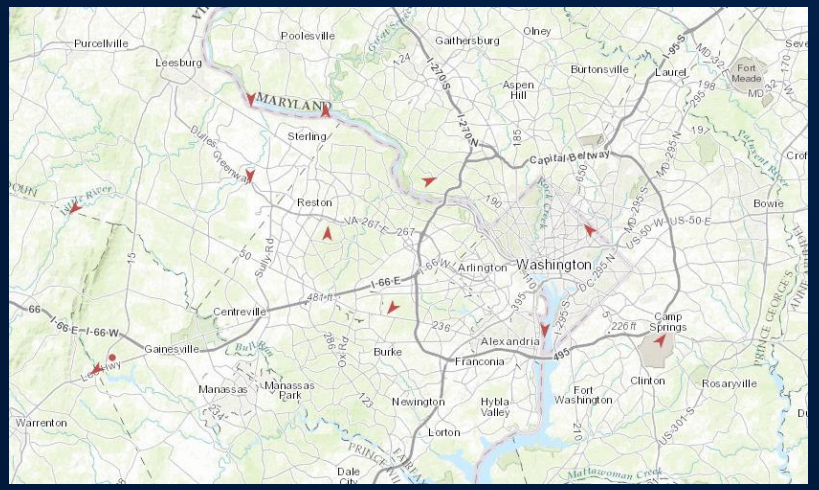
Types of Real-Time Data

Stationary sensors…



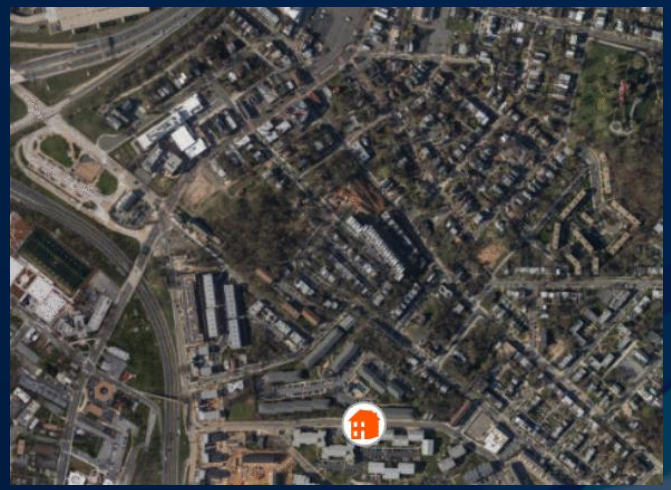
- water gauges
  - weather stations
    - air quality sensors
      - device temperature

Things that move…



- airplanes
  - vehicles
    - animals
      - storms
- ships
  - satellites
    - trains
      - people

Things that just happen…



- crimes
  - lightning
    - accidents
      - tweets

Real-Time Use Cases

Different components and products support different capabilities

Analysis

Visualization

Alerting
& Actuation

Ingestion

Data
Management

Real-Time Use Cases

Different components and products support different capabilities

Analysis

Visualization

Alerting
& Actuation

Ingestion

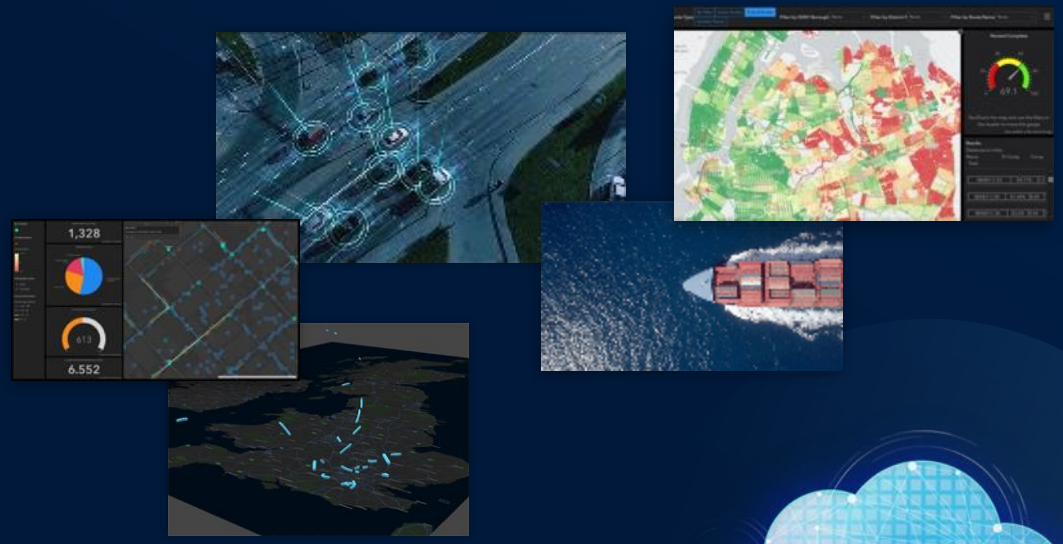
Data
Management

GeoEvent
Server

ArcGIS
Velocity

Real-Time Use Cases

Information Products



Analysis

Visualization

Alerting
& Actuation

Ingestion

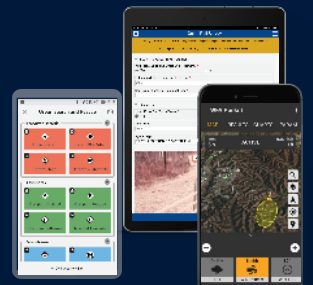
Data
Management

GeoEvent
Server

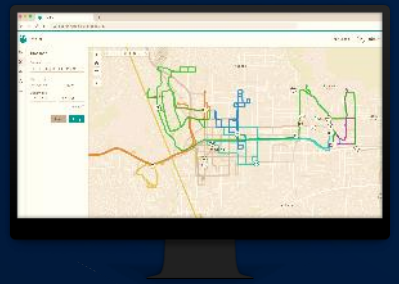
ArcGIS
Velocity

Use Cases in Real-Time Visualization & Analytics

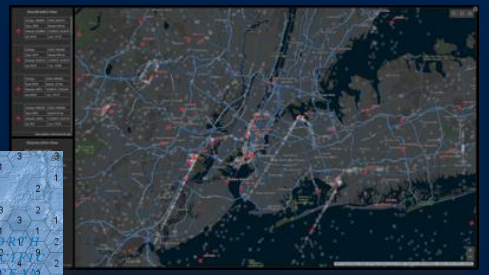
Personnel Tracking



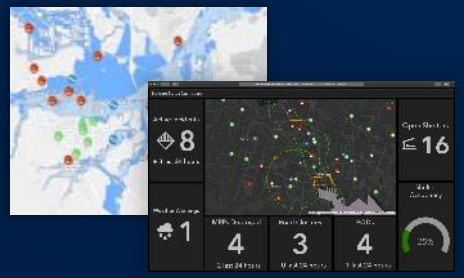
Resource Optimization



Asset & Entity Tracking



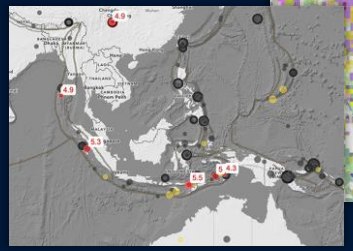
Infrastructure Protection



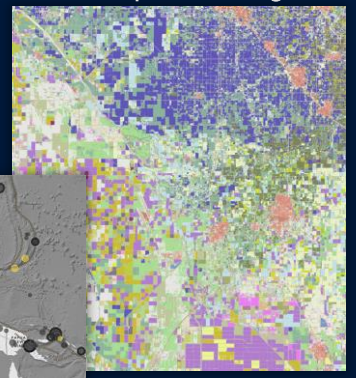
Operations Monitoring

SCADA Integration

Anomaly Detection



Soil & Crop Monitoring



Air Quality Monitoring

Connected Cars

Real-Time Feeds in ArcGIS

Overview

Poll vs. Push

Real-Time Feeds in ArcGIS

- How frequently does your data change?
- How quickly do you need updates?

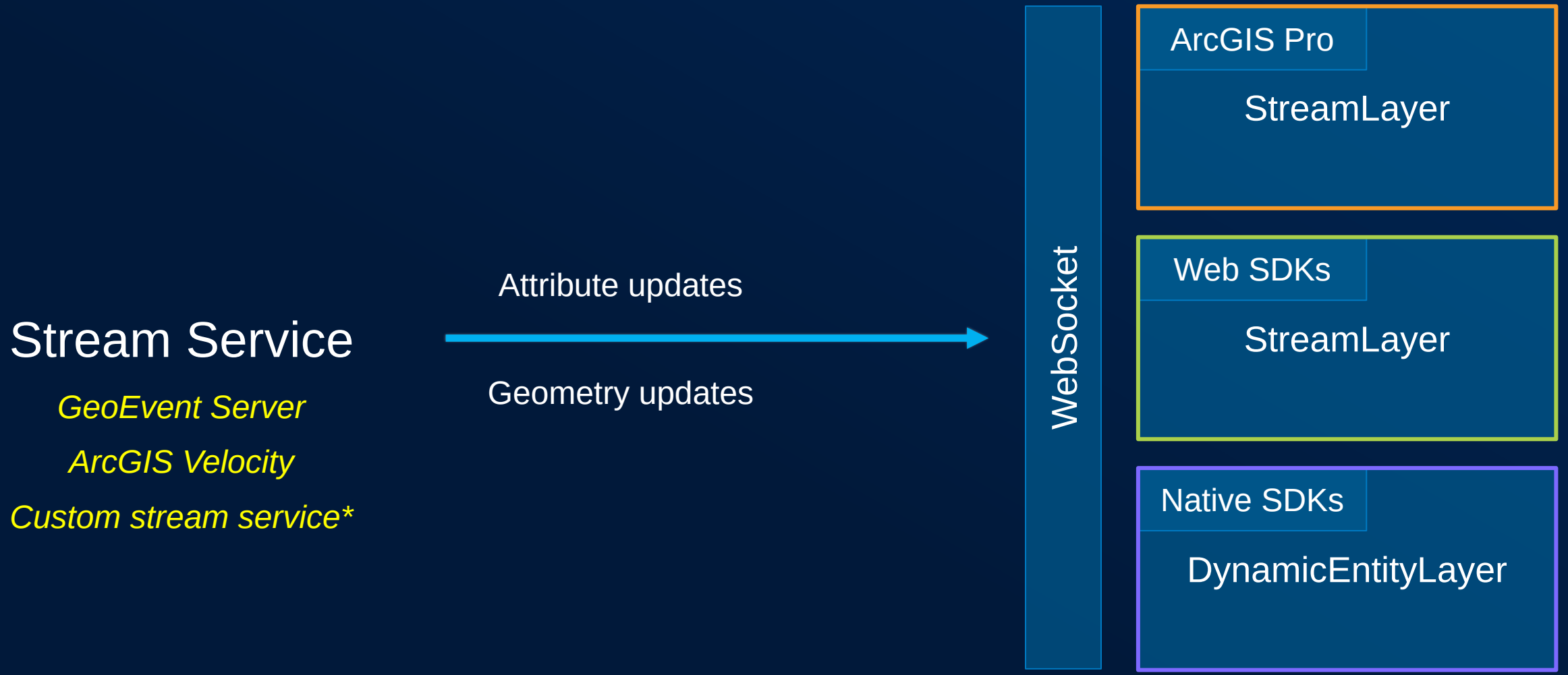
Refresh Interval

WebSocket

Stream Layer

Dynamic Entity Layer

Real-Time Feeds in ArcGIS



Real-Time Basics

Stream Layer (Pro / Web Apps) or Dynamic Entity Layer (Native)

- Connect to stream service
- Track-aware: multiple observations for a single object
- How to manage stale features?
- Same client-side capabilities as other layers*
  - 2D / 3D support,
  - Define a renderer,
  - Analysis,
  - …

Leveraging Real-Time Feeds

ArcGIS Pro, Web Apps, Native Apps

Real-Time Data in ArcGIS

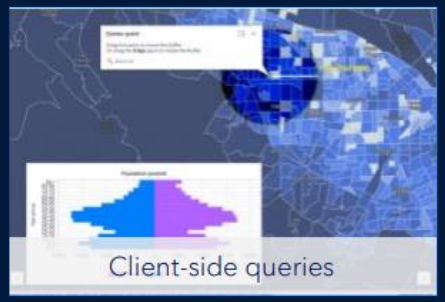
ArcGIS Pro SDK for .NET

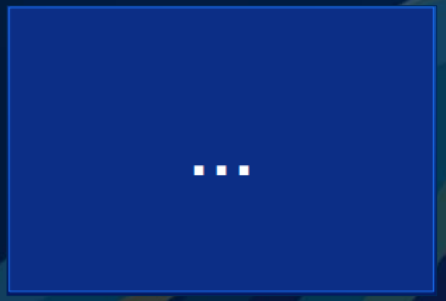
- Stream Layer – visualize and analyze real-time data
  - ArcGIS Stream Service
  - Supports points, lines, and polygons
- Cache observations in memory
  - Work with latest and previous observations
- Real-Time API enables visualization and analysis in real-time

Real-Time Data in ArcGIS

Web Apps and the Maps SDK for JavaScript API

- Create a StreamLayer to leverage feeds in web applications
  - ArcGISStreamService or webSocketUrl
  - Supports points, lines, and polygons
- Same client-side capabilities as other layers





Dynamic Entities API

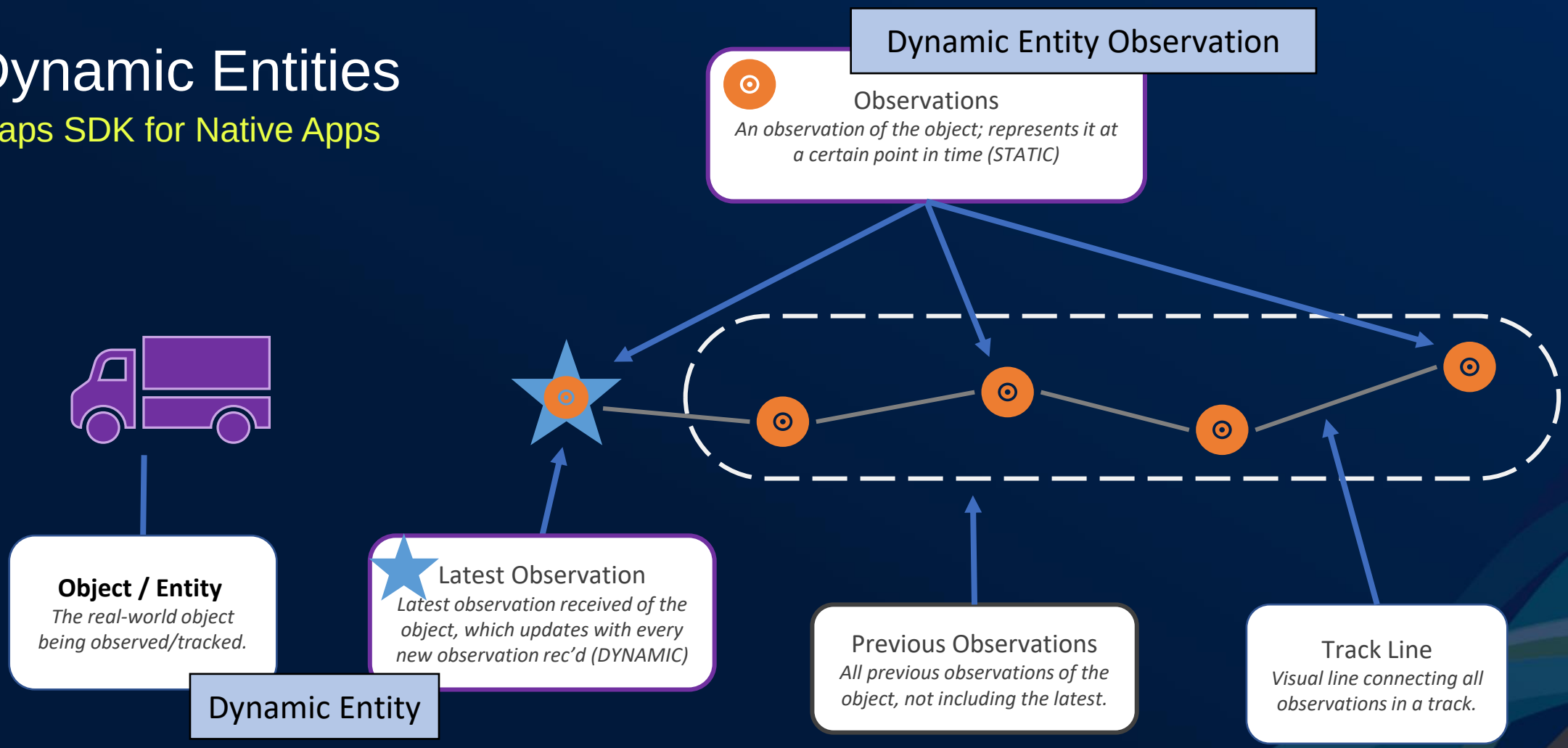
Maps SDK for Native Apps

- DynamicEntityDataSource
  - Manage connection to real-time feed (connection errors, reconnection, filter)
  - Manage how many observations are maintained by the app
  - Notification Events
  - Initial Release: ArcGIS Stream Service

- DynamicEntityLayer
  - Rendering on Map/Scene
  - Track display properties
  - Select/Identify

Dynamic Entities

Maps SDK for Native Apps



Leveraging Real-Time Capabilities in your Apps

Wrap Up

- Stream Layers
- Dynamic Entity Layers

- GeoEvent Server
- ArcGIS Velocity

- Real-time support in Pro, Web Apps, Native Apps (Dynamic Entity Layer)

Additional Resources

- Real-Time Visualization and Analytics

Gain insights into real-time and big data through location intelligence

- Real-Time Visualization Lessons

- Real-Time Lesson Gallery