Introduction to ArcGIS GeoAnalytics Server

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Agenda

• Overview
• Analysis Capabilities + Demo
• Deployment and Configuration
• Questions
ArcGIS GeoAnalytics Server uses the power of distributed computing to quickly process and analyze vector and tabular data with both spatial and temporal components.
Answer difficult questions involving large volumes of data in minutes or hours instead of days or weeks.
Powerful Analytics

Leverage spatiotemporal analysis to answer questions like:

• Using billions of emergency calls accumulated over the past decade, which counties have the largest number of calls per square mile?

• Which stationary pressure sensors in my pipe network have experienced anomalous events in the past 24 hours? Where are there hot spots of anomalous events?

• Where have my delivery trucks traveled and where is the highest density of unique delivery truck paths? Where do delivery trucks travel the slowest?
GeoAnalytics is ready to use with: ArcGIS Pro
GeoAnalytics is ready to use with:

- ArcGIS Pro
- Portal for ArcGIS
GeoAnalytics is ready to use with:

- ArcGIS Pro
- Portal for ArcGIS
- ArcGIS API for Python
- ArcGIS REST API
Easily Connect To Your Big Data

Access and share data within your Enterprise with Portal for ArcGIS

Analyze data in Hive, HDFS, and files

Connect to Azure and Amazon cloud stores

Leverage the ArcGIS Spatiotemporal Big Data Store to store results

Seamlessly analyze data collected with ArcGIS GeoEvent Server
Easily Connect To Your Big Data

**Big Data File Shares**

Read directly from files stored in
- Hive
- HDFS
- Shared folders
- Cloud stores

Supported file types include
- Delimited files
- Shapefiles
- ORC
- Parquet

Use multiple files with a matching schema as a single dataset
Analysis Capabilities

**Summarize Data**
Aggregate Points
Join Features
Reconstruct Tracks
Summarize Attributes
Summarize Within

**Analyze Patterns**
Calculate Density
Create Space Time Cube
Find Hot Spots

**Find Locations**
Detect Incidents
Find Similar Locations
Geocode Locations

**Manage Data**
Calculate Field
Copy to Data Store

**Use Proximity**
Create Buffers
Analysis Capabilities

Familiar GIS tools powered by distributed computing

• Perform common spatial analysis workflows at scale

• Visualize large volumes of data using summarization tools
Demo: Data preparation and summarization
Analysis Capabilities

Work with data in both space and time

• Use GeoAnalytics Tools to perform spatiotemporal analysis

• Define your temporal input data:
  • Instantaneous events
  • Intervals

• Analyze data in time steps

• Visualize results across time using Pro and Portal for ArcGIS
Analysis Capabilities

Work with data in both *space and time*

Spatial aggregation into square bins

Space-time aggregation into square bins
Analysis Capabilities

Work with data in both space and time

Space-time join of (a) polygon to point features and (b) point to polygon features.
Analysis Capabilities

Work with data in both space and time

Track reconstruction using time-series location data
Demo: Spatiotemporal analysis
Analysis Capabilities

Extend the capabilities of GeoAnalytics with ArcGIS Pro

- Seamlessly use GeoAnalytics results as input to desktop geoprocessing tools
- Access Portal items directly from Pro
- Use GeoAnalytics tools in ModelBuilder
- Result layers can be used with arcpy
Analysis Capabilities

Leverage **ArcGIS Arcade** in many GeoAnalytics tools

- Use simple expressions to:
  - Define an incident in time-series data
  - Calculate a buffer distance
  - Determine which features should be joined
  - Calculate a new field value

- Find more info at [https://developers.arcgis.com/arcade/](https://developers.arcgis.com/arcade/)

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Demo: Leveraging Arcade expressions
Components required for ArcGIS GeoAnalytics Server

- Portal for ArcGIS
- ArcGIS for Server
- ArcGIS Web Adaptor
- ArcGIS Data Store (Relational + Spatiotemporal)
Analyze and visualize your Web GIS layers through Pro, Portal, Python Notebooks, or the REST API.
Simple Deployment Pattern

Base ArcGIS Enterprise (Machine 1)

ArcGIS Web Adaptor (Portal)

Hosting Server

ArcGIS Web Adaptor (Hosting Server) Data Store

ArcGIS Spatiotemporal Data Store

ArcGIS Relational Data Store

Portal for ArcGIS

Machine 2

ArcGIS Spatiotemporal Data Store

Machine 3

ArcGIS Web Adaptor (GeoAnalytics Server)

Big Data File Share (HDFS/Hive/File Share)
Multimachine Deployment Pattern

Base ArcGIS Enterprise (Machine 1)

ArcGIS Web Adaptor (Portal)

ArcGIS Web Adaptor (Hosting Server)

Hosting Server

Portal for ArcGIS

ArcGIS Relational Data Store

ArcGIS Spatiotemporal Data Store

ArcGIS Web Adaptor (GeoAnalytics Server)

GeoAnalytics Server

Machines 2 - 4

Machines 5 - 7

Big Data File Share (HDFS/Hive/File Share)
Automated Deployment Options

- **Simplify deployment** of ArcGIS Enterprise and GeoAnalytics Server with:
  - **ArcGIS Enterprise Builder** - single-machine base deployment
  - **Chef Cookbooks for ArcGIS** - multimachine and HA deployments
  - **ArcGIS Enterprise Cloud Builder** - AWS and Azure
System Requirements

- **Base ArcGIS Enterprise deployment:**
  - Minimum 4 cores and 16 GB RAM

- **ArcGIS Spatiotemporal Big Data Store:**
  - Minimum 16 GB RAM for each machine (**32GB Recommended**)
  - Fast disk/sufficient disk space for data

- **ArcGIS GeoAnalytics Server:**
  - Minimum 4 cores and 8 GB RAM for each machine (**16GB Recommended**)
  - Sufficient temp space for compute

- **Compatible with both Windows and Linux systems**
Summary

• ArcGIS GeoAnalytics Server is ready to use “out of the box” with ArcGIS Enterprise

• Distributed analytics help you get “big jobs” done faster

• Analysis capabilities in both space and time offer unique insights

• Easily analyze data from common big data stores

• Visualize large datasets in a clearer and more meaningful way