

Delivering Enterprise Location Technology to a Mature Business

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Journey to Enterprise GIS

A Timeline To A Scalable Solution

J.B. Hunt – Past, Present & Future

1961

- 5 trucks & 7 refrigerated trailers



Present

- 17,400+ tractors
- 121,500+ trailing units
- 106,100+ Carriers
- 24k+ employees
- \$8.6B revenue total 2018



Future

- 360 MarketPlace
- 3PL – 360BOX



Adoption Roadmap – Phase 1 (Legacy)



This is not...

- Secured
- Production
- Highly Available
- Governed

**NOT SCALABLE OR
COST-EFFECTIVE**





SLA to support functionality only:

- Enterprise API's



Adoption Roadmap – Platform Phase 1



This is...

- Secured
- High Availability
- Governed
- Monitored
- User Accepted



Adoption Roadmap - Platform Governance

Capabilities

- Enterprise API's
- A.I.
- Analytics
- Tracking
- Scalability

Rules

- Domain
- What
- When
- Consumers
- Usage Agreement
- SLA

Safety check



Access

- REST API
- Keycodes
- Support
- Monitored
- Cost Analysis



Adoption Roadmap – What's Next?



- Big Data Analytics & A.I.
- Continue Self-Service Model
- Analytics Center of Excellence (ACE)
- IoT Integration
- Real-time Impact Services
- Etc....



databricks®



Technical Journey Pt. 1

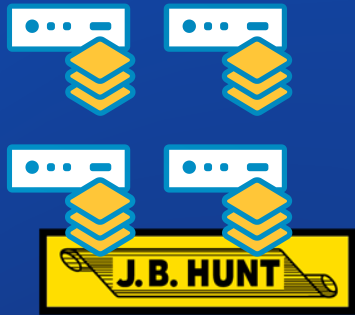
Infrastructure – Discovery of Scalability

SCALE

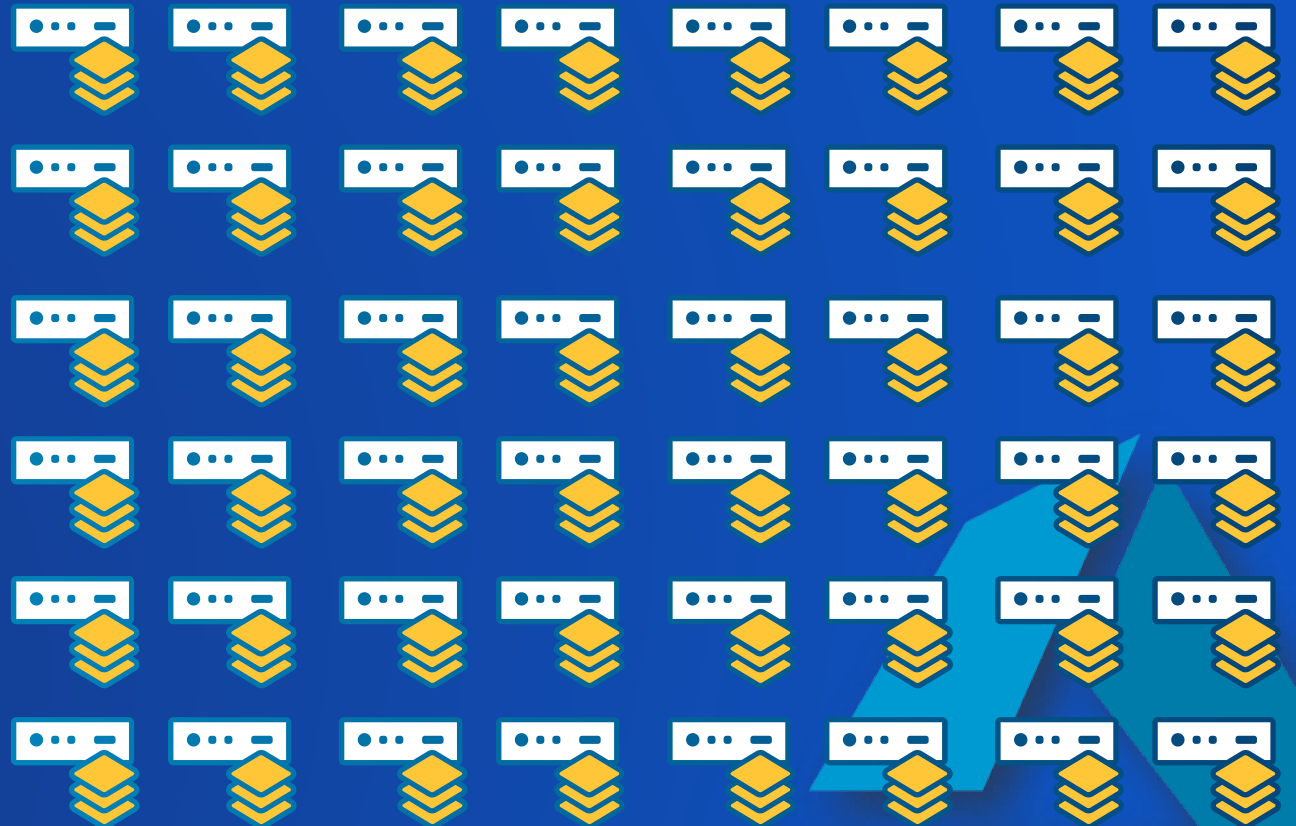


Scale – *overall system size*

Fall 2017



Summer 2019



Scalability - *ability of the system to grow*

Vertical – add/remove resources to/from node(s)



H8 / F64s templates



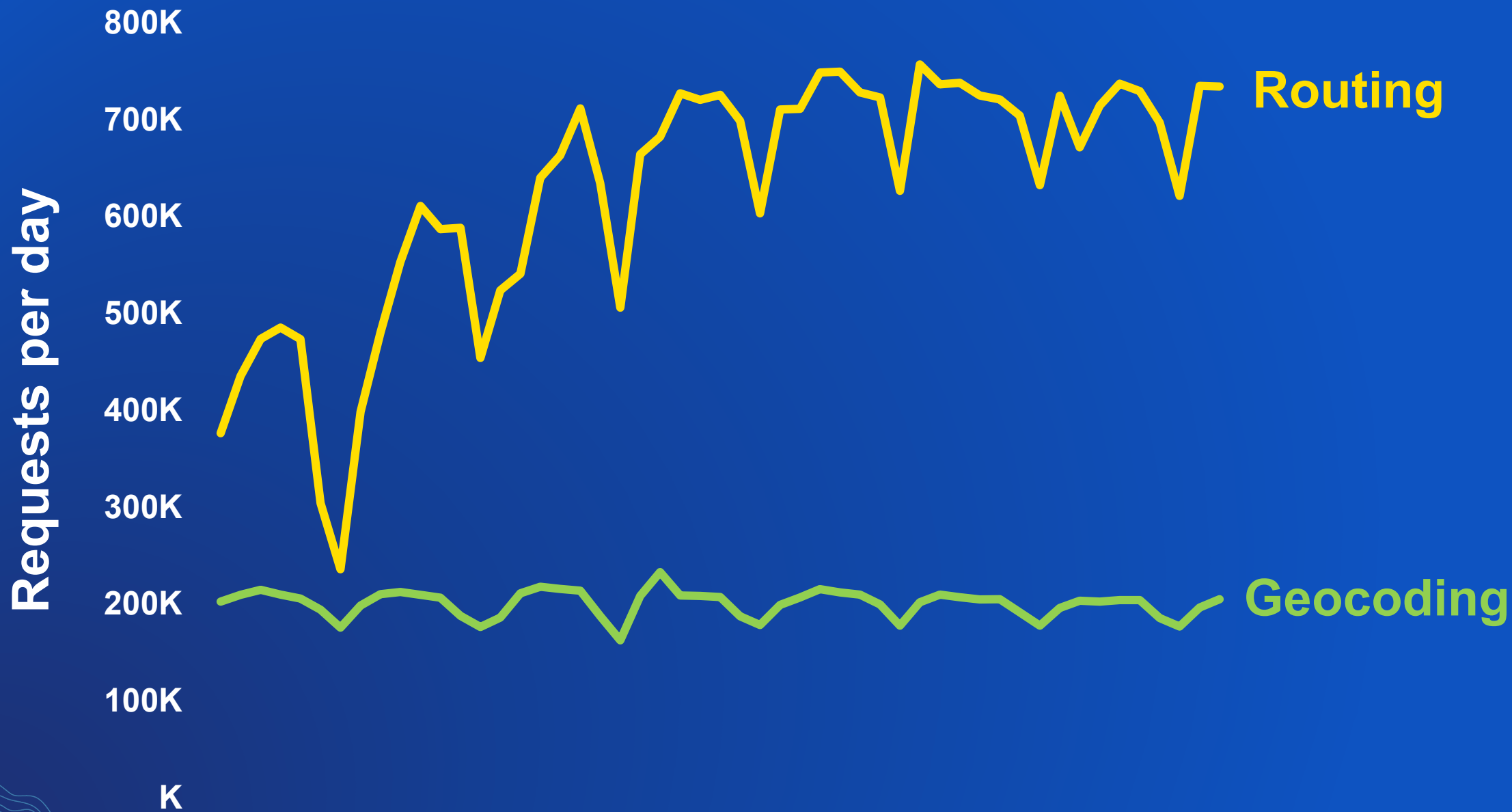
Horizontal – add/remove nodes to/from system



Scale sets / ILB / DNS





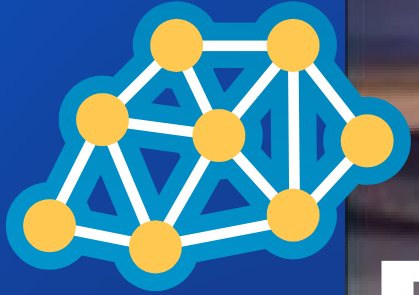


Mid-May 2019 – present

YOU GET AN API

APIs

AND YOU GET AN API



Routing

Geocoding



POI



Traffic



Infrastructure – Lessons learned

Hardships

- Organizational change
- Scaling
- Timelines



Successes

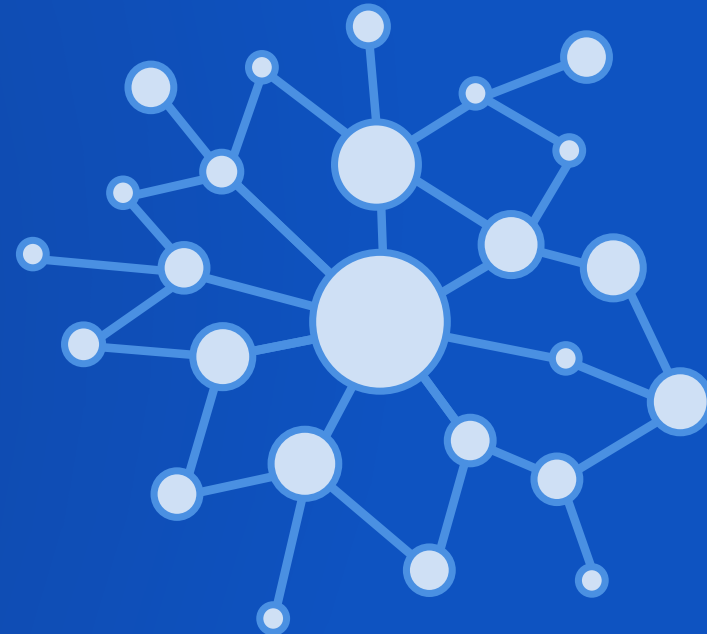
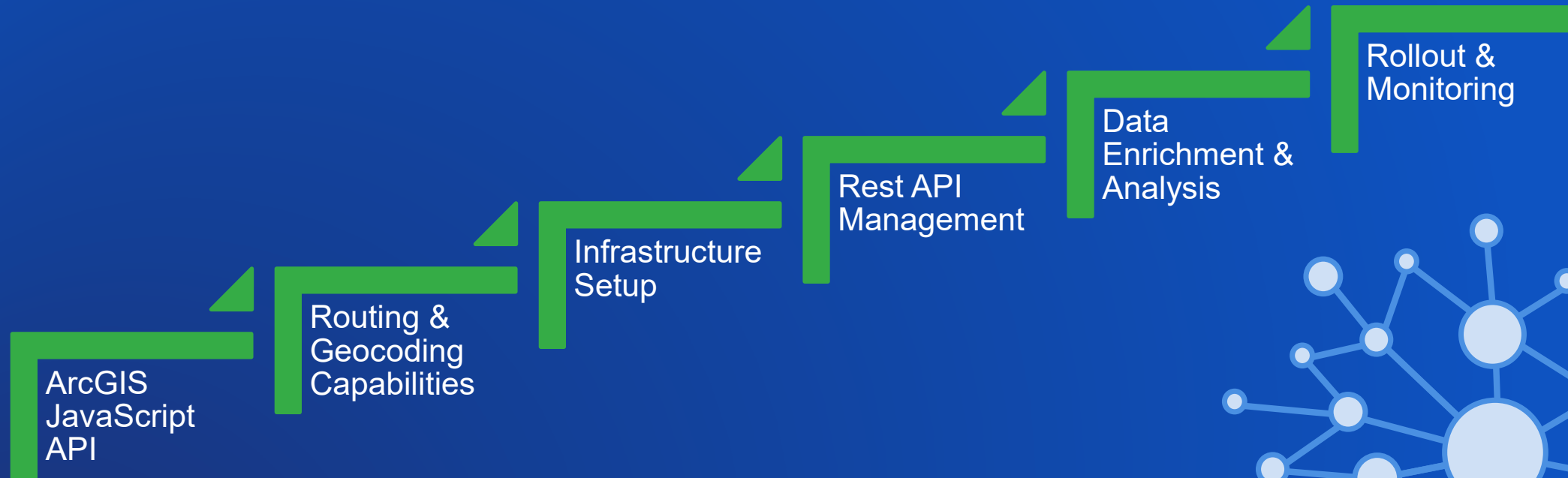
- Planning
- POCs
- Fail quickly



Technical Journey Pt. 2

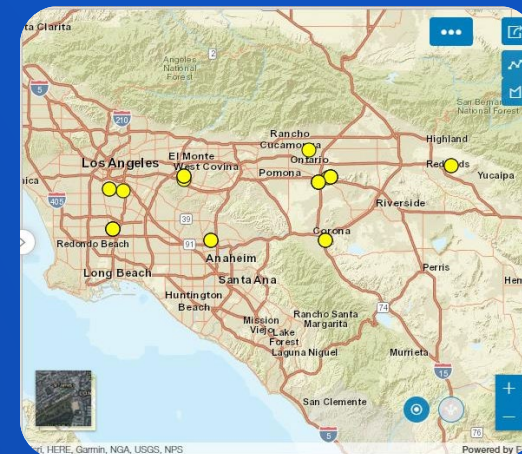
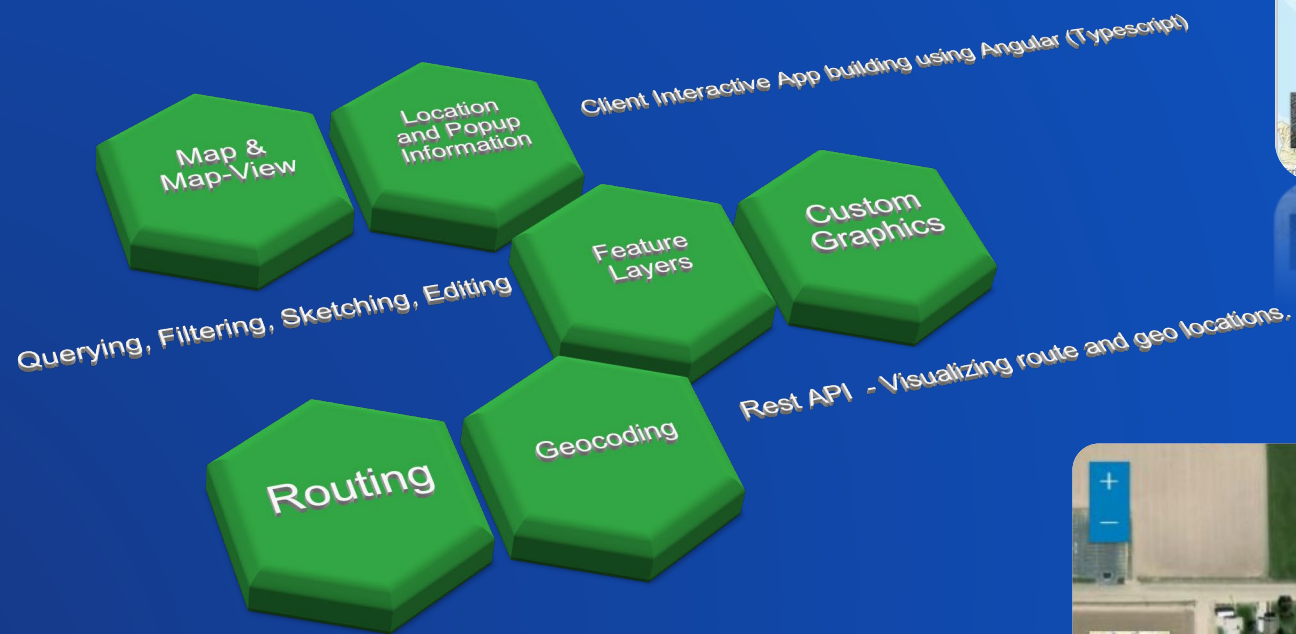
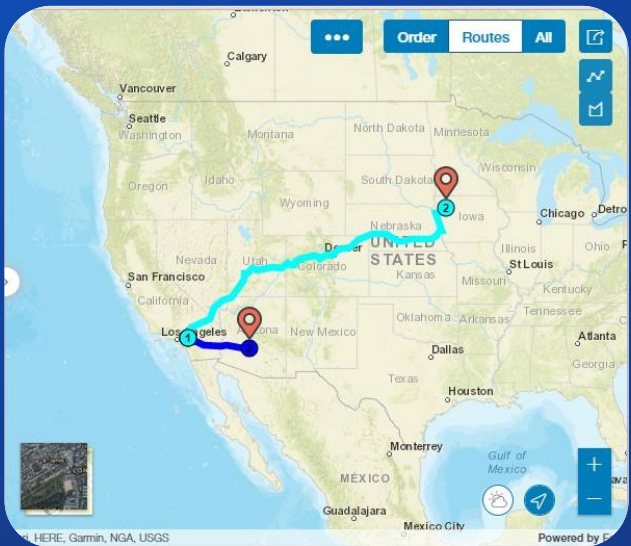
Applications & Data – Delivery of Scalability

Stepping Stones





ArcGIS JavaScript API

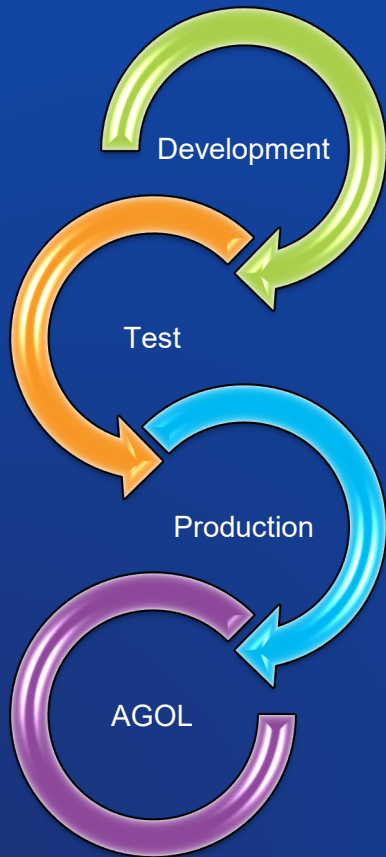


Routing & Geocoding Capabilities

- **Usage of Routing Service**
 - Exploring Geometry data and Visualization
 - Exploring Route and Stop Summary
 - Build Customized Travel Modes Based on Business Requirement
 - Route Directions with traffic data
- **Usage of Geocoding Capabilities**
- **Perform Functional Testing**
- **Perform Load Testing and Analyze KPI's**



Environment Setup



- ❑ **Serverless compute services (Az Functions)**
 - ❑ Automated and flexible scaling on workload volume.
- ❑ **Automatic Token Renewal.**
- ❑ **User Authentication.**
- ❑ **Token key for each application.**
- ❑ **Caching Mechanism for faster response.**
- ❑ **DevOps Pipeline - CI/CD**
- ❑ **ADO Pipeline - Automated Testing**

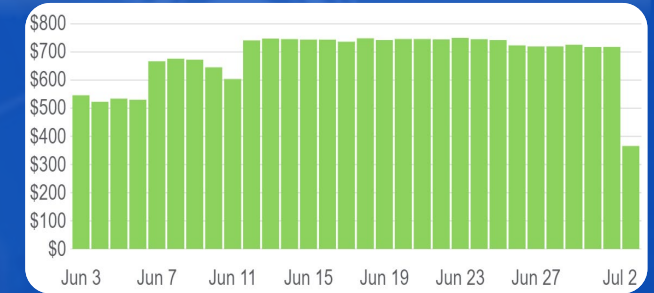
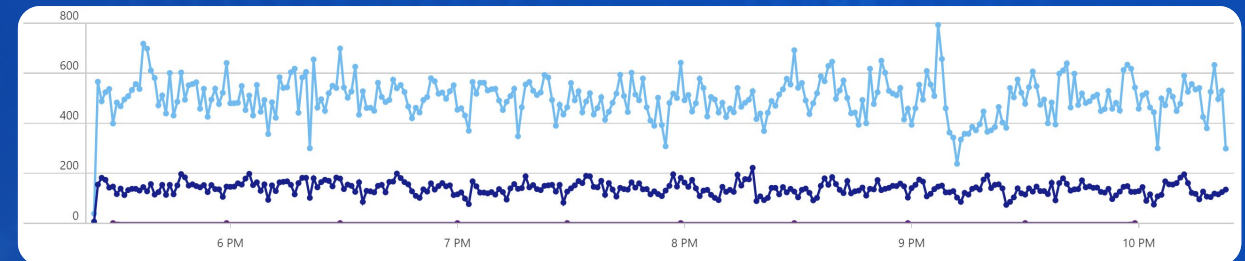
Data Engineering

- Python scripts for Data Analysis and Scheduled Jobs
- Processing Incoming Messages
 - Cache Modeling for easy access.
 - Data Enrichment
 - Data Modeling and Scripting
 - Data Analysis for Business Insights
 - Geo Fencing Calculations
- Geo Event Server for Spatiotemporal Big Data Storage.
- Enriched Data Accessibility for outside world.



Monitoring and Alerts

- Performance Monitoring
- Resource Utilization
- Service Health and Usage
- Alert Mechanism
- Cost Metrics
- Custom query for building dashboard
- Dashboard for each environment



OPERATION NAME	COUNT	AVG DURATION (SEC)
SolveRoute	2.86 M	1.59
ReverseGeocode	2.11 M	0.36
SearchAddresses	352	1.12
GenerateToken	48	1.13

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Thank you!

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