Integrating IoT and ArcGIS

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Integrating IoT and ArcGIS

• How can you connect ArcGIS to the Internet of Things?

• Discuss capabilities of ArcGIS with respect to ingesting, analyzing, and sharing real-time data to improve your decision-making process.

• Present real-world scenarios from several industries.

• Discuss specific product capabilities for real-time data, big data, and geoanalytics.
IoT or Real-time GIS or Big Data

- What is IoT?
- History of Real-time Systems
- IoT and Big Data Systems
We’re Moving From a Data Society to a Knowledge Society

- Improve government, business, and community decisions and knowledge by transforming data capabilities and supporting a data-enabled economy.
Big Data / IoT Take On Different Forms

Volume

Velocity

Variety
Integrate Remotely Sensed Data
Enable the Community to Leverage Government Open Big Data

Many Sensors
- POES
- GOES
- DMSP
- Jason-2
- Suomi NPP
- GOES-R

Intelligent Imagery
- Tropical Storms
- Sea Surface Temperature
- SST Anomalies

Volume
Integrate Real Time Data
Continuous Processing and Analysis Supporting Operations and Decision-Making
Integrate Many Types of Data
Analyze Communities, Provide Insight

- 2013/2018 Demographics
- Access to Care
- Adult Preventive Services Use
- American Community Survey
- Birth Measures
- Building Permits
- U.S. Business Locations
- Business Summary
- Census 1990 Demographics
- Census 2000 Demographics
- Census 2010 Demographics
- Consumer Spending
- Crime Indices
- Death Measures
- EPA Enforcement
- Food Access
- Food Consumption
- Food Stamps
Decomposing an IoT Solution

Decision Support Systems
- design and planning
- strategic decision making
- scenarios, alternatives, options
- 3D visualization
- stakeholder engagement
- open data
- app empowerment
- reporting and storytelling
- ‘geodesign’

Physical Urban Structure
- “built environment”
- intelligent transportation systems (ITS)
- smart grid / smart metering
- smart parking
- high performance buildings
- green infrastructure
- etc...

Sensors and Remote Actors
- IoT
- ubiquitous computing
- embedded sensors
- big data + analytics
- reality capture (e.g. drones)
- information infrastructure ‘cloud’
- etc...

Cisco, Siemens, IBM ‘Smart City’
Deployment Patterns

- On-premises
- As-a-service
The Proof of the Pudding…

**Commercial**
- Financial Services
- Insurance
- Logistics / Trucking
- Manufacturing
- Media & Entertainment
- Real Estate
- Retail

**Natural Resources**
- Agriculture
- Forestry
- Mining
- Oil & Gas
- Pipeline

**Transportation**
- Aviation
- DOT
- Railways
- Maritime & Ports
- Public Transit

**Utilities**
- Electric & Gas
- Teleco / Cable
- Public Works

**Water**
- Water resources
- Water / wastewater / stormwater

**Professional Services**
- AEC
- Environmental Mgmt
- GIS & IT

**Nonprofits & Education**
- Conservation
- Humanitarian
- Sustainable Development
- Higher Ed
- Research/Science Institutions

**Government**
- National
- State
- Local

**Health & Human Services**
- Hospital & Health Systems
- Pharmaceuticals
- Public Health

**Defense and Intelligence**
- Intelligence
- Military Operations

**Public Safety**
- Emergency / Disaster Mgmt
- Fire, Rescue, EMS
- Homeland Security
- National Security
- Law Enforcement
- Special Events

1,000+ Organizations
80 Countries
Geospatial Analysis as part of IoT Solutions

- ArcGIS Enterprise
- GeoAnalytics Server
- Big Data
- GeoEvent Server
- Spatiotemporal big data store
- IoT
- Ingest, analyze, store, analyze
- Big Data

The diagram illustrates the integration of ArcGIS Enterprise with IoT solutions, highlighting the roles of GeoEvent Server, a spatiotemporal big data store, and GeoAnalytics Server in handling data ingest, analysis, storage, and visualization.
Trends in IoT

- Cloud Providers Moving into IoT
- New Solution Providers
- Esri Plans