Smart Transportation

Make Transportation Safer, Smarter and Stress Free

Progress in transportation, IoT and software industries is making travel safer for people and it is driving smarter communities. Innovation promises cities with no pollution, stress-free commutes, on-time arrivals, automatic rerouting and significant reduction in dangerous accidents.

Progress in Transportation Technology

Modern cars, busses, planes, trains, trucks and other forms of transportation are like mobile datacenters with a network of onboard computers making autonomous decisions on the fly. Powered by smart sensors and onboard data processing, these systems can also provide drivers and operators critical information on their performance and give them the ability to adjust to their surroundings.

Innovation in sensors, communications, robotics and analytics technology also allows the transportation industry to digitally transform itself, with new solutions and service offerings enabling unprecedented system safety, performance and availability. These new services not only result in cost savings or new lines of business, but also in improved quality of life for those they serve. Remote communities will become more connected and cities will become greener. Unproductive time and dependence on public safety and law enforcement can be reduced as well.

Digital Transformation Requires Real-Time Adaptation

Metrics gathered from sensors can provide powerful insights into fleet maintenance and operations, passenger safety, and fuel efficiency. By correlating and analyzing data from across the fleet network, fleet operators can establish real-time visibility into mobility. This can be challenging, however. Data sharing and collaboration across multiple management authorities and jurisdictions can be difficult. On top of that, the transportation ecosystem is highly heterogeneous and various vehicle manufacturers, modes of transport, supply chains and other sources of intelligence result in inconsistent and unpredictable data formats and communications protocols.

A central processing entity is needed to tame this complexity – a Smart Transportation Operations Center (STOC) that can collect, normalize and correlate the various inputs and overlay them with machine learning capabilities. This approach enables operators to draw insights and push data-driven decisions across the transportation network.

Industry Approach: Smart Transportation Operations Center

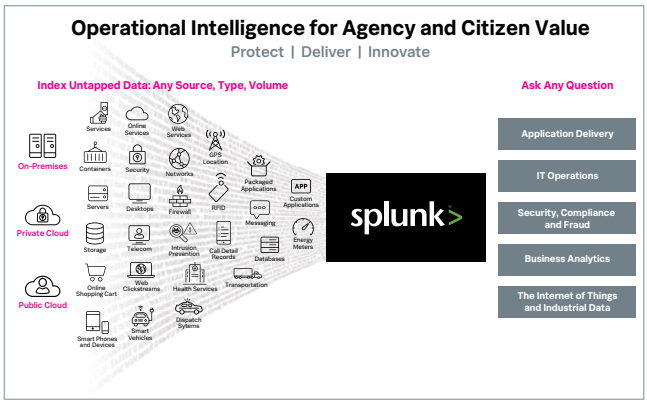
Transportation system applications, sensors and other infrastructure can create voluminous data at a rapid rate. This data has to be correlated and aggregated in the context of a specific situation and across operational phases, in real time, to effect the best response. Centralized learning is critical to ensure that new scenarios and conditions are absorbed, analyzed and communicated to appropriate entities so they can adapt and react.

A STOC aims to enable this central transportation nerve center by providing end-to-end visibility across the operational lifecycle to maximize utilization, ensure efficiency and improve safety. This lifecycle can be managed across:

Infrastructure Operations and Security	Ensure that the fundamental IT applications and infrastructure that control and manage the fleet and are resilient, perform to standards and are secure
Routing, Driving and Safety	Evaluate metrics in real time to manage safety risk and to provide insights on how to best navigate and adapt to conditions
Utilization and Performance	Analyze historical data to ensure vehicle suitability, efficient fleet distribution, maximize fuel consumption and route worthiness
Maintenance	Mine component-level metrics and operating conditions to predict time-to-failure and enable predictive or condition-based maintenance
Disposal	Utilize historical record to determine residual value, ensure efficient fleet and vehicle utilization, and plan for replacement

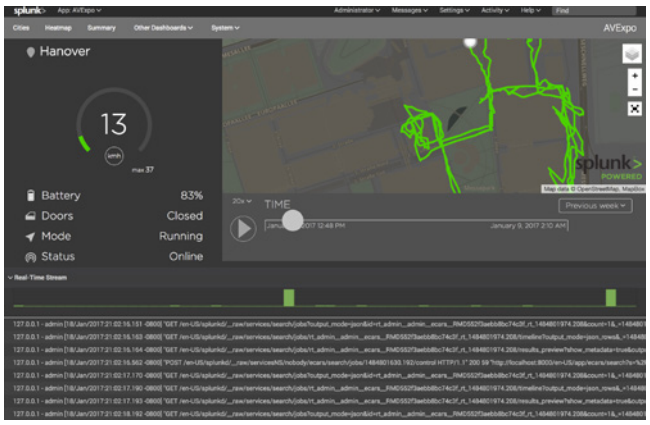
The STOC should scale from monitoring and precision-managing one asset to a fleet or geographically dispersed network. Besides data from transportation systems, the center should ingest contextual and referential information such as traffic, weather and crowd-sourced information, further enriching insights. These insights do not just provide feedback to the network but can also enrich decisions all the way back to the planning and design phases.

In many cases, a single STOC may not be sufficient. STOCs can be set up based on transportation modes, jurisdiction, management authority or other factors. Each STOC could share information with others and operators would be empowered by collaboration and communication. A waste management STOC, for example, may monitor garbage trucks and connected trashcans and dumpsters, while a public safety STOC could manage their emergency services and law enforcement fleet. The STOCs could share traffic, road conditions, and other information to ensure that all stakeholders have a common understanding of all factors that could affect availability, performance, security and safety.



Enter Splunk

Every connected vehicle generates machine data – an authoritative record of its inputs, decisions and actions. This includes data from sensors, in-vehicle applications, audio and video analytics systems, GPS, and many types of machine-to-machine communications. Machine data is also produced by the infrastructure and web, mobile and cloud-based applications that support smart and connected transportation.



The Splunk platform is unique in that it can collect, ingest, analyze, report and alert on all of this machine data in real time—regardless of source or format. Data can also be enriched with contextual information from external sources like weather feeds and asset and maintenance databases. Transportation

operators and managers can use Splunk analytics to explore, analyze, and even apply machine learning to gain new insights and unprecedented visibility into the operations, security, and community impact of their high-value assets.

Splunk customers are already realizing multi-fold returns on investment and are seeing improved operations and favorable business results based on machine data-driven insights from freight locomotives and ships, passenger vehicles and even airplanes. **DB Cargo**, the European Union's largest rail freight transport operator, is leveraging Splunk to monitor the health of their locomotives, gain real-time insights into their performance and move towards a condition based maintenance regime. Splunk is helping **Gatwick airport**, the world's most efficient single runway airport, manage passenger experience from curb to gate and ensure efficient aircraft turnaround process. A leading **auto manufacturer** is using Splunk to gain insights into the battery performance of its electric vehicles under various conditions. Lastly, **Royal Flying Doctor Service** delivers medical services to remote locations in Australia and uses Splunk to monitor the flights and medicine and vaccine temperatures.

Be prepared to handle the volume, variety, and velocity of machine data generated by connected transportation, and to deliver value from that data through improved availability, performance and security.

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