CONNECTED VEHICLES IN THE MILITARY

Accelerating Mission Operational Efficiencies

A convoy is racing through a hostile environment on a relief mission. There are no drivers and every occupant is focused on the operation. Each vehicle stays in constant touch with each other as well as with the base, alerting on terrain conditions, speed adjustments, hazards, fuel status and other important metrics. Drones flying ahead of the convoy transmit real-time images of the terrain ahead, enabling the convoy to make any necessary alterations. Real-time information from the vehicles and other sources offer the base quick insights to continuously track the probability of success and make course corrections as necessary. Surprises are minimal, and are easily handled and success assured.

The military has been working with autonomous and connected vehicles since the turn of the century. The vehicles can reduce the need to deploy soldiers for combat missions, humanitarian relief efforts, troop resupply and rescue operations. With advancements in sensors, communications, robotics and analytics, missions once impossible are now within grasp.

Drones, unmanned aerial vehicles (UAV), unmanned ground vehicles (UGV) and other autonomous vehicles are being employed to reduce the frontline involvement of humans. Autonomous vehicles can help soldiers by:

- Handling vehicle navigation and maneuvering

- Reducing the risk of injury and death

- Eliminating the need for backup drivers

- Getting alerts in advance to steer clear of impending dangers

- Supporting fleet management, including their efficient allocations

- Increasing operational life through preventive maintenance efforts

The Internet of Things (IoT) and sensors are making their way into every component of a vehicle. Metrics gathered and correlated can provide powerful insights into operational conditions, mission worthiness, time to replacements, deployment needs and a variety of other factors that can impact the success of a mission. At the same time, operational vehicle-to-vehicle (V2V) communications can help harness the power of the collective to ensure that the mission is accomplished in the most efficient and effective way. For example, danger sensed in the path of a ground vehicle can be overcome by engaging air support to clear the hurdles. On-board technologies can be self-learning, establishing a real-time map of the terrain and its dangers and providing valuable information to other vehicles on navigations, safety and mission efficacies.
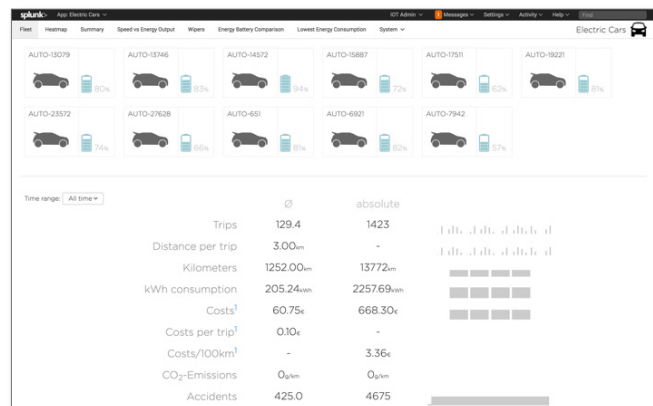
Industry Solution:
Connected Vehicles Operations Center

Because connected vehicle information comes in fast and in the context of a specific situation, it needs to be aggregated and correlated in real time for optimal results. A Connected Vehicles Operations Center aims to provide the end-to-end visibility across a vehicle or fleet's lifecycle. Analysts in the center can monitor vehicles across four distinct phases: fleet

management, operations, maintenance and disposal. Real-time data collected from the vehicle within each phase and correlated for contextual analysis offers insights into many attributes including condition, performance, mission worthiness, repairs and more.

Fleet Management	Monitoring of assets for inventory. Helps with decisions on requirements by troops, efficient delivery, just-in-time inventory, loss reductions and accountability.
Operations	Analyzes key metrics to maintain operational efficacy and safety with real-time insights on how to best navigate and serve as early warning system.
Maintenance	Uses component-level metrics to predict time-to-failure, enabling preventive maintenance and planning for repairs needed and part availability.
Disposal	Ensures that assets have been used to the fullest potential and that replacements are available with similar or better capabilities.

The Connected Vehicles Operation Center can scale from monitoring and precision-managing one vehicle to a fleet and further to geographically dispersed units. The more information that is available from connected vehicles, the higher the enrichment and keener the insights.

Enter Splunk

Fast and confident decisions require powerful insights in real time. Every smart or connected instrument generates data. When this *machine data* is aggregated from all relevant sources, it can be harnessed and correlated with contextual information to deliver unprecedented insights across discrete operations. This can be challenging since the number of technologies used introduces heterogeneity and increases the spread of non-standard communication protocols. Further complicating the issue, other sources of intelligence can make data formats and types unpredictable and inconsistent.

The Splunk platform can ingest raw machine data— regardless of source—and accommodate its velocity, variety, variability and volume. This includes data from sensors, systems and applications, SIGINT, HUMINT, GEOINT and various other intelligence sources. The machine data can be further enriched with contextual information from relational databases and meta data sources.

Splunk software uses schema-on-read technology to freely analyze and correlate data without the limitations of traditional database schemas. Scaling to hundreds of terabytes per day, Splunk software can meet the needs of any organization and supports clustering, high availability and disaster recovery configurations. It provides consistent end-to-end visibility and enables analysts and operators to ask any questions, and progressively drill down to understand the situation to increase awareness across stakeholders and enable fast decisions. Operators and commanders can predict and prescribe actions, extend the appropriate support structure, ensure fleet availability on demand, strategically plan across various missions and ensure human safety.

Learn more about how the public sector can leverage machine data.