Connected Car – Trip & Driver Score Analytics – Case Study

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Client Overview

- Client is a group company of a Tier-1 automotive parts supplier operating in 3 continents

- The client was incorporated to deliver enhanced value through connected car and telematics solutions

- With manufacturing facilities in Asia and Europe, the client has international offices in North America, Europe, China and Japan

Business Requirements

- The client had developed a plug-and-play IoT product that reads and sends event logs, trip details, engine, battery health etc. to a mobile app

- The requirement was two-fold as stated below:

  a) Setup Big Data Infrastructure that supports real-time events - impact alerts, tow alerts, driving violation alert etc.

  b) Develop Advanced Analytics / Machine Learning Algorithms to help car owners optimize their trips based on previous trips across multiple drivers, monitor driving behavior of their kid/driver and their vehicle's health

Key Challenges

- Design of a horizontally scalable, low-latency architecture that supported both real-time event processing and batch analytics

- Balancing tuple processing across the Storm topology using corresponding stream grouping, to ensure that a car's data was processed by the same Storm bolt

Our Approach

- We designed and implemented a Big Data infrastructure inspired by lambda architecture that consists of both batch and speed layers
- We developed a custom algorithm to calculate driver score and optimize trips based on past trips across drivers

Our Solutions

- The car owner's mobile app persists IoT sensor data in MongoDB. We used Kafka to stream MongoDB's data to – a) Synchronize it in HBase for near real-time Trip & Driver Score Analytics using Spark MLlib, and b) Process real-time events by Storm, in addition to real-time Trip & Driver Score Analytics
- The Trip & Driver Score Analytics output was loaded back into MongoDB

Results

- The product bundled with analytics was successfully launched, and is currently sold as a safety and convenience device
- International Automobile manufacturers rebrand and sell the IoT product and platform we've delivered

Case Study