Success Story

Big Data Processing & Trip/ Driver Score Analytics for Connected Cars

Business:
Big Data, Advanced Analytics, Machine Learning

Domain:
Automotive, IoT

Tools:
MongoDB (Database)
Kafka (Streaming Platform)
HIVE - Spark (Data Warehouse)
Spark MLib (Machine Learning)
Hbase/ HDFS (Data Lake)

Key Highlights

Key Success:

» The trip and driver score data helped improve safety by nearly 20%.

» The sensor data pertaining to the trip and vehicle parts helped improve vehicle maintenance and servicing schedules.

» The client rebranded Indium Software's product & analytics and sold as an IoT-based safety and convenience device, creating a new revenue stream.

Client

The client is a group company of a Tier-1 automotive parts supplier operating in 3 continents and was incorporated to deliver enhanced value through the connected car and telematics solutions. With manufacturing facilities in Asia and Europe, the client has international offices in North America, Europe, China and Japan.

Overview

IoT and big data are 2 sides of a coin; Indium Software was entrusted to build the big data infrastructure for the client's connected-car IoT devices, to support real-time events such as impact alerts, tow alerts, driving violation alerts etc. Indium Software also developed the Advanced Analytics & Machine Learning models to help car owners optimize their trips based on a range of factors, monitor the driving behavior of their kid/driver, check their vehicle's health etc.

1 Business Requirements

The requirement was two-fold as stated below:

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

» 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.

2 Indium Software's Approach And Implementation

» Designed a horizontally scalable, low-latency architecture that supports 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 is processed by the same Storm bolt.

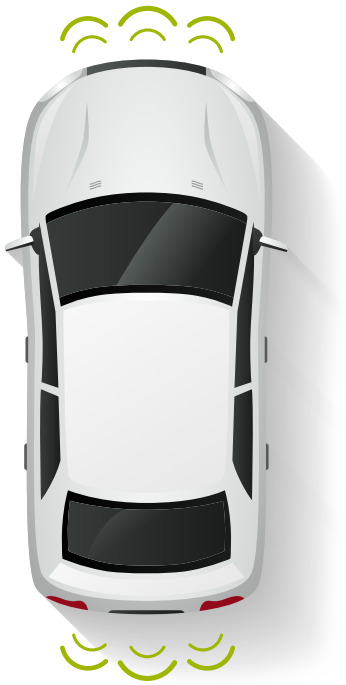
» Designed and implemented a Big Data infrastructure inspired by Lambda architecture that consists of both batch and speed layers.

» Developed a custom algorithm to calculate driver scores and optimize trips based on past trips across drivers.

» The car owner's mobile app perseveres IoT sensor data in MongoDB. Kafka was used to stream MongoDB's data to:

- Synchronize it in HBase for near real-time Trip & Driver Score Analytics using Spark MLlib.
- 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.



3 Business Impact

» The trip and driver score data helped improve the safety by nearly 20%.

» The sensor data pertaining to the trip and vehicle parts helped improve vehicle maintenance and servicing schedules.

» The product bundled with analytics was rebranded and sold as an IoT-based safety and convenience device

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