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Advanced real-time analytics on telematics data at the extreme edge of the network

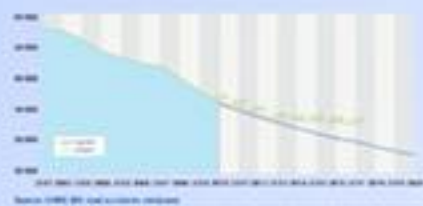
The PrEstoCloud use case

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Road fatalities in the EU

There is an estimation that each death on Europe's roads results in four persons with permanent injuries (e.g. the brain or spinal cord), and eight persons with serious injuries. Therefore, telematics systems such as driver behavior monitoring and fleet performance management have gained increasing attention nowadays.



Nowadays, vehicle telematics such as vehicle tracking solutions, location-based navigation technologies, fleet management systems, and traffic information services has gained increasing attention in the context of Big Data management paradigm.

Introduction

The major challenge is the fast extraction of useful information from the data streams and triggering automated alerts at run-time to help stakeholders such as driver, logistic center, insurance company and vehicle owner. The CVS Mobile logistic solution prototyped by PrEstoCloud proposes a new advanced telematics system which provides a real-time data-intensive computing framework at the extreme edge of the network.



Results

The CVS Mobile logistic solution observes driving dynamics and extracts important information through real-time data analytics at the extreme edge of the network. When an edge node is not able to provide computing operations, for example if the free storage capacity on the edge node is not available any more, or if the edge node is overloaded due to an increase in the number of sensors during execution, computing tasks provided on the edge node should be terminated and started on the cloud infrastructure at runtime.

Conclusion

This new proposed system is able to trigger alerts at run-time and notify stakeholders such as drivers and logistic centers on situations where new decisions should be made or attention is required (e.g. dangerous maneuvering, sudden lane change, etc.). Moreover, this telematics system orchestrated upon edge computing framework proposes a method for drivers' behavior profiling, where the major outcome is detailed understanding of their behavior with possible feed-back loop to improve drivers' activities.

Edge computing architecture

The data generated by vehicles' sensors (e.g. accelerometer and magnetometer, etc.) need to be processed at run-time to recognize important driving actions in an instant. This is because one of the major causes for vehicle accidents is inattention or distraction. In this work, edge nodes deployed in vehicles are employed to analyze data at run-time next to the location where the sensory data are generated.

