Excelfore and Red Hat standardize automotive OTA updates

Opportunity

Most automakers measure success by their ability to manufacture great cars and trucks. However, today's connected vehicles provide a game-changing possibility: adding new features or augmenting existing functionality after the cars and trucks roll off the factory floor. The key to this perpetual product improvement is over-the-air (OTA) updates. These software updates allow original equipment manufacturers

(OEMs) and suppliers to continuously increase the quality of vehicles by upgrading high-level software as well as low-level code on the electronic control units (ECUs) and other onboard modules.

Automakers can achieve a competitive advantage with OTA

This capability for ongoing innovation in the automotive product life cycle has disrupted the industry. OTA updates—which are released from some of the leading makers of electric and connected vehicles once a month or more—can make cars safer, improve their performance and handling, and add differentiating capabilities. Plus, it all happens while the vehicles are on the road. Car manufacturers who fail to take advantage of connected technology and the capabilities for continuous vehicle improvement that it provides risk falling behind those that do.
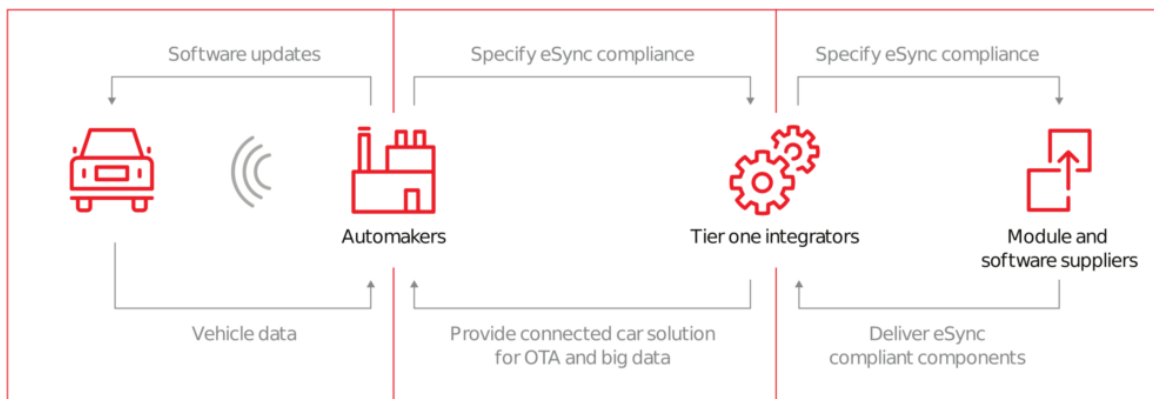
While many updates deliver enhancements to features such as navigation systems, others address software issues in critical systems like anti-lock brakes. These OTA updates can happen either transparently or as downloads initiated by the vehicle owner. However, this process is currently executed in various forms and without any common industry standard. The many protocols have led to a fragmented market.

eSync Alliance: Leading an OTA standard

One of the organizations championing a common OTA industry standard is the eSync Alliance. As its primary goal, the alliance is working to build a standardized bidirectional data pipeline between the cloud and all in-vehicle ECUs and sensors. Its core technology working group (TWG) has a number of functions, which include:

- Compliance and interoperability specifications.
- Compliance testing program.
- Software development kits (SDKs) and reference implementations.
- Product roadmaps.

The goal of eSync Alliance is to allow all companies in the automotive value chain to participate in OTA, including companies that have yet to partner with an OTA vendor or have not already created an in-house solution. Ultimately, the eSync Alliance wants to create one standard that spans cloud-to-car-to-device connectivity, vehicle gateways, data management, and middleware with end-to-end cybersecurity. Standardization will allow players in the automotive industry to reach any eSync-compliant module—such as telematic control units (TCUs), ECUs, in-vehicle infotainment systems, and advanced drivers assistance systems—across boundaries of the various in-vehicle networks.

Software updates → Automakers → Specify eSync compliance → Tier one integrators → Specify eSync compliance → Module and software suppliers

Vehicle data ← Provide connected car solution for OTA and big data ← Deliver eSync compliant components

Open source boosts standardization

According to the 2020 Open Source Security and Risk Analysis Report, 99% of all commercial code bases audited contained one or more open source components. This widespread adoption is due in part to how open source allows developers to focus on innovation rather than having to reinvent common functionality. In fact, common functionality makes up a total of 70% of audited open source code bases. Open source software and standardization is also inherently more secure, compared to its proprietary counterparts, because when everyone can access the code, threats can be discovered and patched more quickly.

For the automotive industry, cloud-native application development with open specifications and application programming interfaces (APIs) has allowed companies to develop and release applications much faster. Accelerated development means quicker time-to-market, which helps automakers differentiate themselves from their competition through new applications and services.

Red Hat is working with the eSync Alliance to use containers and the hybrid cloud for OTA updates through the eSync OTA platform. The collaboration will accelerate automotive industry innovations, such as shifting to zonal controllers, introducing Linux® in the car, increasing open source standardization, and developing container-based approaches.