



SECURE OVER-THE-AIR ARRIVES: HERE OTA CONNECT

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Table Stakes for Highly Automated Vehicles

Secure and reliable Over-the-Air (OTA) software management is mission critical to enabling highly automated driving technologies. HERE acquired Advanced Telematic Systems in January to facilitate highly secure and open automotive OTA software management. HERE's new OTA Connect solution is the first offering within its recently created OTA Software Suite product line. It enables updates for security patches, map data, firmware of Electronic Control Units (ECUs), and sensor data configurator engines. HERE OTA Connect advances new monetization models across the value chain, from infotainment content and performance upgrades to cost savings and connected vehicle services, such as diagnostics and prognostics, thus avoiding or addressing recalls remotely or preventing vehicle performance degradation.

OTA Connect has been developed to support on-premise hosting at an Original Equipment Manufacturer's (OEM) datacenter or infrastructure provider. The global, scalable footprint allows worldwide deployment, with HERE's services already active in more than 100 million cars. This is already a market-approved technology, with multiple OEM engagements in place across several diverse regions/countries. There will be added benefits and synergies ahead through integration into the HERE platform, and the remainder of HERE's connected services portfolio.

Global Oversight and Expectations

The capability to make remote vehicle updates is gaining international attention and there is a push for mandatory requirements. The United Nations (UN) Task Force on Cyber Security and OTA is pursuing global regulation next year. Nationally, the United States, the United Kingdom, and Germany are developing OTA legislation. International technical standards, such as the ISO/SAE 21434 for Road Vehicles, include cybersecurity and OTA and will be published in 2020. Overall, there are numerous recognized technical, government, and industry associations addressing standards for cybersecurity and OTA. OTA security framework Uptane leverages best-in-class open-source attributes with funding from the U.S. Department of Homeland Security. OEMs and suppliers, which are responsible for 78% of vehicles on U.S. roads, support this end-to-end framework, as well as prominent academic and research institutions.

Standard OTA requirements include those for the backend, security, client, and operations. Solutions must be fully scalable, with a secure encryption system and key infrastructure, supporting both Transmission Control Unit (TCU) and secondary ECU updates, as well as full image and partitioned updates. Campaign management must be able to scale, both in terms of the millions of vehicles being updated, and the size of the updates being disseminated.

Security, Complexity and Extensibility

No vehicle solution is relevant without holistic and robust security, especially with the advent of increasingly advanced automation functions in vehicles. The HERE OTA Connect solution has been developed to address software updates for connected and automated cars.

Separation of duties for OTA updates provides both security and flexibility. Separate crypto signatures and vehicle validation, with both online and offline keys, enable compromise resilience and on-demand customization. Additionally, flexibility is made possible as OEM clients are able to control how updates are signed and selected for a vehicle.

Uptane's role as an OTA security framework involves addressing repository compromise both inside and outside of the vehicle. There are no trade-offs between flexibility and security commonly found in current systems. There are two repositories to address compromise resilience. Additionally, Uptane protects resource-constrained secondary ECUs and includes suppliers in its flexible security framework.

Complexity is another gating factor, as automotive electronics include real-time visualization of road conditions and traffic, numerous communications and infotainment options, High-Definition (HD) mapping, and early phase prognostics. These allow a range of suppliers from automotive OEMs and Tier Ones to telematics and other service providers to potentially access continually evolving big data and highly granular insights on the vehicle, driver, and environment. OTA technology is also relevant to the crowdsourcing paradigm, including an increased software presence within connected vehicles on the road and expanded campaign management used to reconfigure combinations of sensor inputs. A best-in-class software delivery mechanism is key to the future of a more connected and autonomous vehicle.

Beyond the OTA Software Suite, the new OTA Connect solution's technology capabilities could be leveraged further and more deeply across the rest of HERE's portfolio. The technology may be used in new business opportunities across the supply chain to support secure map and software updates for connected devices, commercial vehicles from long haul to last mile, and airborne drones. The opportunities to expand in an increasingly automated world will only grow exponentially over the next decade and beyond.

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