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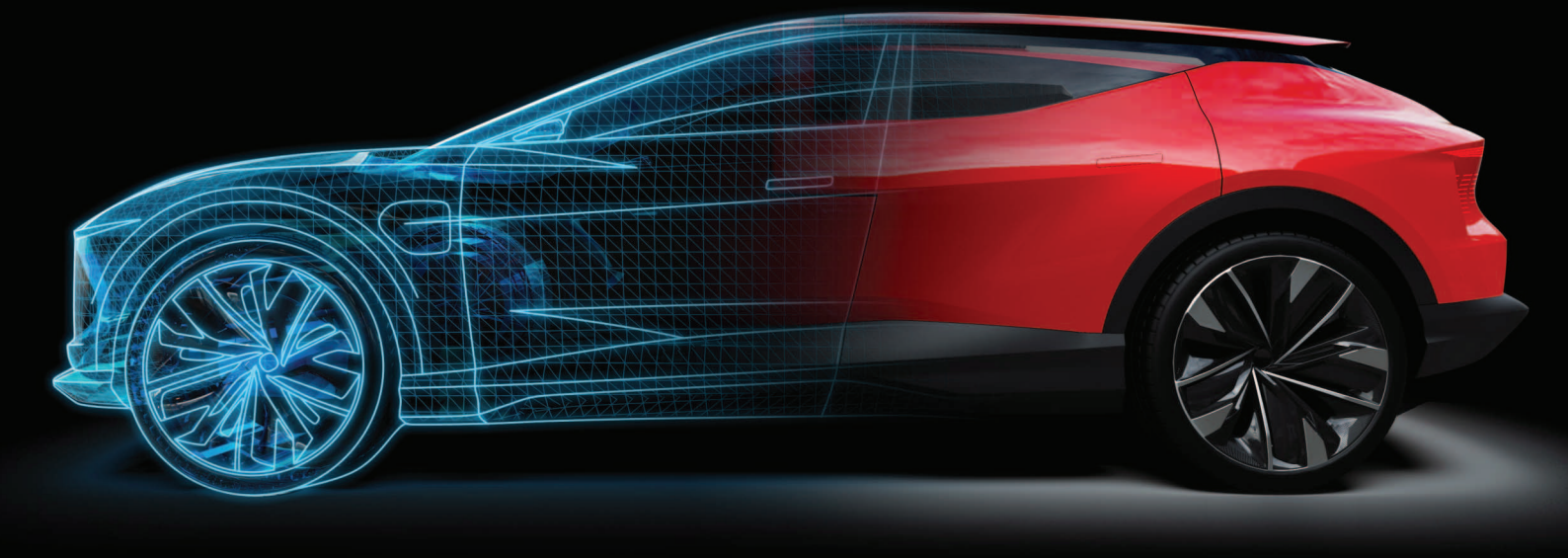

Sonatus: rethinking OTA solutions in the era of SDVs

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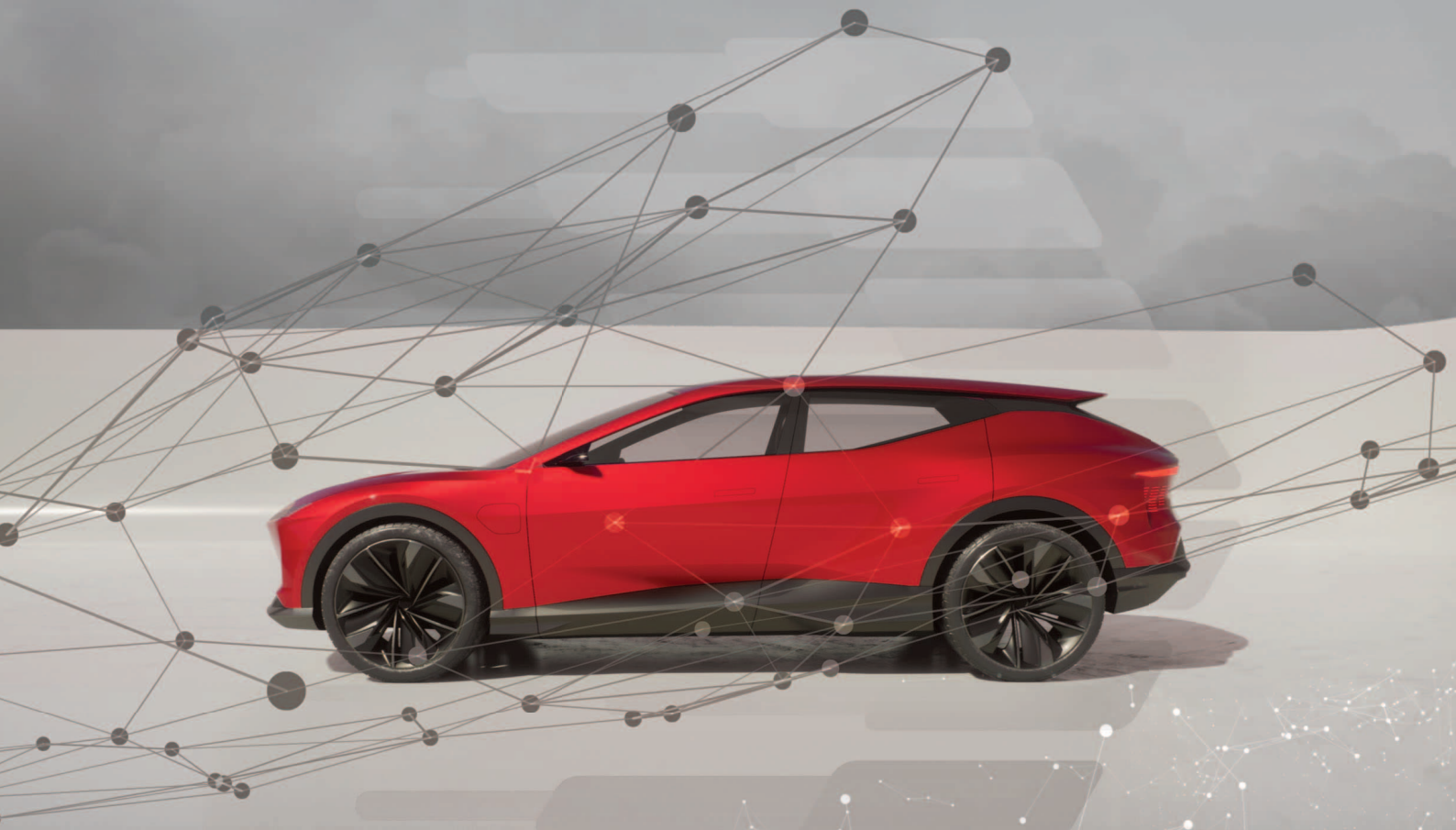

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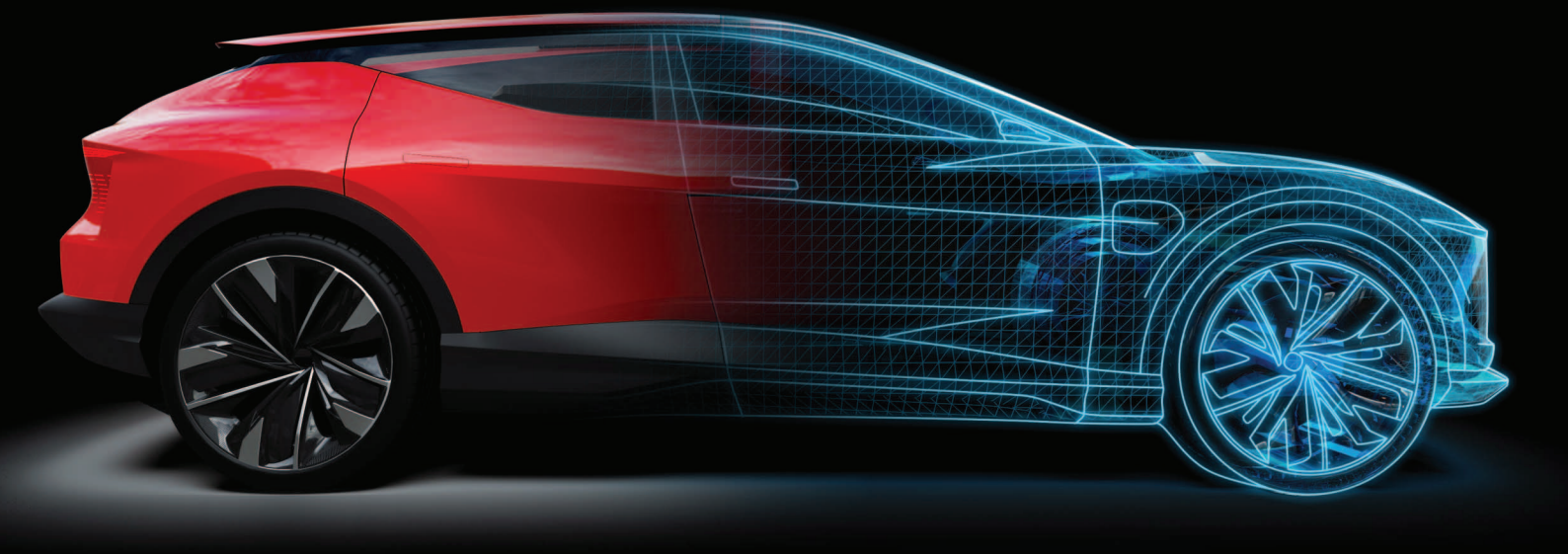


Sonatus: rethinking OTA solutions in the era of SDVs

As connectivity improves and vehicles become more software capable, the right OTA solutions can unleash the full promise of SDVs. By Will Girling

Images © Sonatus

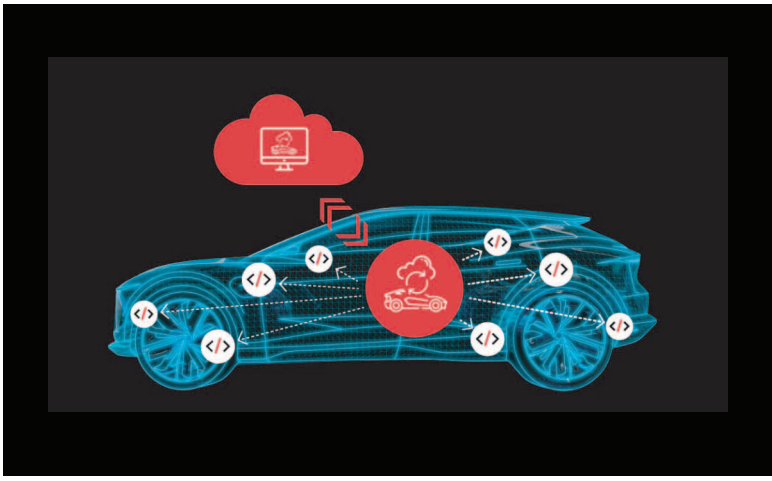
While software-defined vehicles (SDVs) intersect with automation, connectivity and personalisation, there is one key concept that underpins everything: updateability. Adding, improving, and expanding vehicle capabilities after production through iterations of software has the potential to unlock substantial new value in the automotive industry–up to US$650bn by 2030, according to a September 2023 report by Boston Consulting Group.

However, as hardware and vehicle architectures become increasingly sophisticated, updates will need to encompass everything from advanced driver-assistance systems to smart lighting, infotainment, and battery management systems. More sophisticated functionality also means higher costs and complexity, and both automakers and Tier 1s need operational agility to manage SDV evolution coherently.

While over-the-air (OTA) updates have been around for a while, there is a clear need for more innovation in this field to realise the full promise of SDVs. Industry consultant SBD Automotive's 2023 Connected Car Forecast found that 66% of new cars sold in the US, Europe, and China were OTA-capable–180 million total, which could rise to 500 million by 2030. Sanjay Khatri, Head of Product at SDV tech company Sonatus, believes OTA solutions must be purpose-built for the SDV era, where vehicles continue to improve long after they are produced and sold. "The whole point of software-centric architectures is the ability to keep vehicles performing their best and continuously delight owners with new features. OTA updates are what will deliver on that vision," he tells *Automotive World*.

A 'single pane of glass' for OTA

In January 2024, Sonatus soft-launched the beta version of Updater, its secure OTA management product, at CES in Las Vegas. "We announced it to start a conversation with our OEM customers and partners around a new type of OTA solution," says Khatri. Many existing automotive OTA offerings are adapted from examples in the mobile device industry, but he doesn't believe this kind of retrofitting is necessarily the best option for the SDV era. "If an update fails on a mobile phone, you can just try again. If it takes a vehicle out of commission, that's a big problem."



Sonatus' vision for OTA is a unified, cloud-based platform to replace the automotive industry's currently fragmented software ecosystem

Furthermore, the industry's current approach is generally very fragmented. "In-vehicle infotainment suppliers, for example, might provide both the system and an OTA capability for it," explains Khatri. Spread out across several pieces of bespoke hardware from many companies, vehicle systems can quickly become convoluted. Sonatus' goal is to provide simplicity with the visibility, certainty, and

> **Automakers can't plan their SDV architectures without first considering the companion OTA solution that needs to go along with it**

precision necessary for managing OTA software updates safely and uniformly across all vehicle systems.

Sonatus Updater, a cloud and embedded solution, is a comprehensive platform for firmware, application software, and policy updates across classic, domain, zonal, and high-performance electronic control units (ECUs). "With today's SDV concept, it's no longer a case of updating binary code or re-flashing an entire ECU; automakers and suppliers need to address a variety of new types of software assets in the vehicle," explains Khatri. "From our conversations with OEMs, the idea of a 'single pane of glass' to manage all asset types, not just firmware, really resonated."

Solving pain points

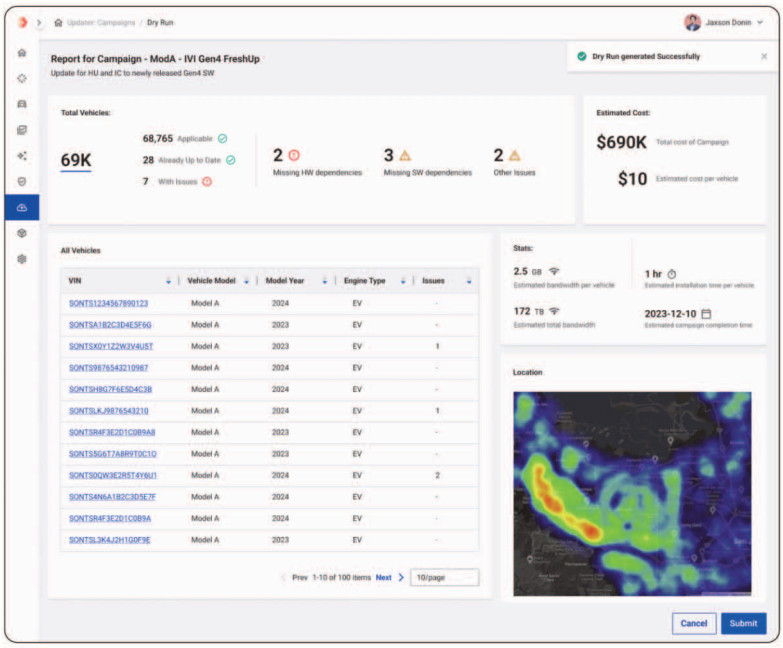
Even large automakers are struggling to be more software-centric, investing large sums of cash in partnerships to access the expertise and technology necessary. SDV development is moving away from the multitude of 'black boxes' to a more software and update friendly E/E architecture. Sonatus is on a mission to help OEMs during this shift by providing the critical building blocks, such as Updater.

Providing end-to-end traceability during an OTA campaign, Updater gives automotive engineers granular visibility into where and when OTA update faults occur, accelerating troubleshooting and debugging up to 70%. 'Dry-run' capabilities through the use of cloud-based digital twins of vehicle configurations allow automakers to measure the size, efficacy, and cost efficiency of an update before real-world application. Finally, Sonatus will automatically recommend and apply 'delta update' algorithms to minimise the size of the update package. The company estimates this can reduce update sizes by up to 95%, which subsequently lowers user costs by shortening OTA transmission.

Sonatus is currently at various stages of engagements with both passenger and commercial vehicle OEMs, according to Khatri, and has found a general consensus on the need for a uniform OTA solution for vehicle-wide updates. In addition, since Tier 1s often bundle OTA capabilities with their systems, he believes working with them could also be a significant vector for Updater's future growth. "Once

one system in a vehicle features Updater, it will become very appealing for OEMs to expand that capability into a unified, vehicle-wide solution."

As manufacturers like Volvo Group and Daimler Truck jointly embark on developing the first software-defined truck platform, Khatri observes another opportunity for OTA. Although this segment wouldn't necessarily overtake the higher volume passenger SDV market, the high investment per truck would incentivise updateability, as it would extend fleet lifecycles and add new value to assets. "Commercial vehicles have a lot of operational performance requirements that would benefit from regular software updates," he states.



Sonatus Updater enables the user to perform a 'dry run' software update, measuring the costs and benefits for real-world deployment

OTA: delivering on the promise of SDVs

To ensure the highest level of service, OTA update products must themselves evolve in-line with the latest SDV trends. Looking ahead, Khatri envisions a cloud-native pipeline for the automotive industry to achieve continuous improvement and development. "Think of it like an cloud-based software assembly line that provides a continuous stream of software updates." Essentially, OTA campaigns would run automatically, constantly adding small feature updates throughout a vehicle's lifetime instead of large, monolithic changes at pre-determined times during the year. In practice, this could also allow software to be developed ahead of hardware, which would then simply be "plugged in" to the OTA pipeline once ready.

Notably, automakers are already grappling with the cultural challenges associated with bringing SDV products to fruition. The new dynamic requires them to operate more like a Big Tech firm than a vehicle manufacturer. However, Khatri emphasises that embracing OTA-driven change is imperative: "SDVs are supposed to be about continuous improvement and personalisation. That can't be done through hardware–without a purpose-built OTA solution, the promise of SDVs won't be realised."

He concludes that updateability must become part of the end-to-end design process for software-centric vehicles instead of an add-on for later consideration. "Automakers can't plan their SDV architectures without first considering the companion OTA solution that needs to go along with it." By facilitating flexible, transparent and precise OTA capabilities, Sonatus hopes Updater can become an integral part of the OEM-supplier ecosystem that leads to a more holistic and exciting vision for software-defined mobility.