Zonal Architectures: Enabling the Full Promise of SDVs

Sonatus and NXP collaborate to solve top architectural challenges on the road to safer, smarter, and more efficient vehicles

THE CHALLENGE

Zonal Architectures are positioned to revolutionize vehicles by allowing OEMs to decrease wiring harness weight and set the foundation for more scalable architectures required for full SDVs. However, the transition to zonal imposes significant new technological challenges. Unlike statically configured legacy architectures that physically isolate each domain to achieve performance, safety, and security, zonal architectures feature multiple ethernet switches in a richly connected topology and the ethernet links between the switches may carry mixed criticality traffic from multiple domains or applications. This dynamic environment requires OEMs to adopt dynamic new technologies to manage it.

THE SOLUTION

Sonatus Networking team collaborated with NXP to develop a holistic zonal architecture solution with a functioning demo. The solution employs modern, software-defined networking concepts to provision the network from a centralized network controller. The network controller is topology and service-aware and can be dynamically updated with lightweight policies deployed from the cloud to support diverse application traffic of mixed-criticality while meeting reliability and performance requirements essential for vehicle safety. It provisions the network to handle link outages and reconfigures the network dynamically.

IMPACT

The joint solution united hardware and software expertise to generate valuable learnings for both Sonatus and NXP on how to realize complicated architectures. Some of the notable outcomes included
1) Validating a solution that was capable to support a wide variety of application traffic including external vehicle traffic such as HTTP and MQTT, SOA (SOME/IP), Audio & Video, Diagnostics, and CAN-over-Ethernet, all with mixed levels of criticality.
2) Progress in creating a flexible and application-aware network that enables continuous updates of vehicle applications while ensuring critical vehicle functions. These learnings are a significant milestone in realizing zonal architectures.

SONATUS

The Sonatus Vehicle Platform provides key building blocks for creating dynamic vehicle software infrastructures by offering modular enabling technology solutions that incorporate proven data center principles.

Sonatus is targeting customers in the automotive, commercial vehicles and heavy machinery industries. Their focus is on applications in business areas such as engineering, product planning, connected services, and after-sales and service.

SONATUS

HEADQUARTERS
United States, Sunnyvale, CA

FOUNDED
2018

NO. OF EMPLOYEES
51+

WEBSITE
sonatus.com

ACKNOWLEDGEMENTS

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ABOUT STARTUP AUTOBAHN

STARTUP AUTOBAHN powered by Plug and Play is an open innovation platform that provides an interface between innovative tech companies and industry-leading corporations. The basis of the program is the partnership that develops between startups and the corporate business units. The two entities hold an equal footing from the get-go: together they evaluate the potential for a joint venture, move forward to pilot the technology, and work to achieve the ultimate goal – a successful production-ready implementation. Designed with the intention to exceed startup acceleration, STARTUP AUTOBAHN powered by Plug and Play moderates a community for collaboration with a focus on implementable results. Over the years, the platform has successfully cultivated over 400 projects with more than 300 startups since its founding in 2016.