Demo Brief

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A Software-Defined Vehicle Transformation Starts with Intel

The future of automotive is software defined. The Intel® Automotive software-defined vehicle (SDV) demonstration is a first look at a faster, simpler path to SDV architecture.

To support new automotive technology features and capabilities, automakers have relied on a microcontroller-based architecture. Over 100 microcontrollers and over a mile of cable are required to deliver modern experiences and capabilities.

The answer to this growing complexity is the software-defined vehicle (SDV). The SDV architecture operates automotive features and functions as software workloads that can be consolidated on a high-performance compute platform. This makes vehicle features and systems easier to develop, scale, and upgrade, and it simplifies cloud integration.

Automotive use cases and AI-infused technologies operated by the Intel® Automotive software-defined vehicle demo

- Environmental parity between cloud and vehicle platforms
- Large language model (LLM)–based voice assistant
- AAA gaming for rear-seat passengers
- 3D instrument cluster
- Navigation
- Front-seat entertainment (streaming and gaming)
- E-mirrors
- Surround-view camera ingestion and display
- Videoconferencing
- Driver behavior monitoring

Intel opens a new path to SDV development

Intel pioneered software-defined architecture in the data center, and now that expertise is delivering a flexible path for SDV transformation. The Intel® Automotive software-defined vehicle demonstration shows that a single Intel® system-on-chip (SoC) platform can be partitioned and spliced to support multiple concurrent automotive workloads and enable a range of SDV use cases. And it does it without compromising critical workloads or safety measures.

Automotive-qualified Intel® Automotive SDV

The extensive functionalities demonstrated by the Intel Automotive SDV demo stem from the Intel® Automotive SDV SoC Family's capabilities. This automotive-grade SKU incorporates the innovations of the Intel Automotive SDV SoC Family into vehicles, and features tailored enhancements designed to meet the demanding standards of vehicle operation. Automakers and solution developers can take advantage of capabilities, including virtualization, containerization, AI inferencing, and onboard graphics acceleration, to design efficient systems that deliver great experiences and business results.

Enabling flexible SDV designs with workload convergence

The Intel Automotive SDV demo runs multiple OSs, with different workloads and criticality, all on the same piece of silicon.

Real-time OS (RTOS)

QNX OS for Safety, an automotive RTOS, runs safety tell-tale monitoring applications.

Android VM environment

A virtual machine (VM) runs Android apps on the Android application framework as well as Linux apps running in a container on top of the Android Linux kernel.

Ubuntu

This VM performs system I/O mediation and dedicates compute resources for rendering the instrument cluster while maintaining its required quality of service (QoS).

Compute components of the Intel® Automotive SDV demo

Intel® Automotive SDV SoC Family

intel REALSENSE

Intel® RealSense™ Vision SoC V5-A

intel ARC GRAPHICS

Intel® Arc™ A770 discrete graphics

Highlights of the demo for automakers

- Offers compute power to support a range of automotive use cases on a compact, highly efficient platform containerization
- Enables shift-left software development with open systems on a consistent vehicle-to-cloud architecture
- Supports real-time AI inferencing on data from multiple cameras
- Demonstrates real-time stitching of multiple camera streams
- Provides ample headroom for additional automotive workloads and a road map for many years of service ahead
- Utilizes Intel's regionally balanced supply chain offering made in the USA and made in the EU products
- Gives automotive developers access to modern computing techniques, such as virtualization and containerization, while ensuring freedom from interference across partitions to safely operate critical workloads

An open path gets you there sooner

Intel's commitment to open platforms means our automotive partners are free to choose their preferred OS, hypervisor, or other middleware solutions. And they won't have to worry about vendor lock-in or proprietary APIs limiting their pace of innovation.

Intel® Automotive SDV Demonstration

A practical vision of the SDV future

Employing silicon soon available for the automotive industry, the Intel Automotive SDV demo supports a range of functions—from infotainment to critical safety features—on a single automotive-qualified platform. This workload convergence can speed and simplify the development of SDV solutions and systems.

E-mirrors
Cameras bring in live video to replace traditional mirrors.

Surround-view safety monitoring and parking assist
The demo ingests four simultaneous camera streams and stitches them together for an overhead parking-assist view.

3D instrument cluster
The demo runs a partitioned RTOS for safety monitoring, while the visualization runs on Ubuntu OS.

Intel Automotive SDV SoC Family-based automotive qualified system-on-chip
The Intel Automotive SDV SoC Family powers a range of automotive workloads—including AI inferencing—and still has headroom for more. The integration of Intel® RealSense™ Vision SoC V5-A augments ingestion, AI-inferencing, and vision signal processing, while the Intel® Arc™ GPU provides the extended graphics, display, and media capabilities of the platform.

Premium entertainment experience
You can play Android movies or join video conferences. The Intel Automotive SDV demo integrates an Intel® Arc™ A770 discrete graphics card to deliver AAA gaming in the back seat.

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The first stop on a long road map

This SDV demo is just the first glimpse of where the Intel Automotive SDV SoC Family-based automotive system-on-chip (SoC) can go. It sets a path to long-term success for automotive solutions, with continual advances in performance, security, and reliability from Intel.

Explore the future of SDV architecture at intel.com/automotive.

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