RTI Connext Drive for Software-Defined Vehicles

REAL-TIME DATA TRANSPORT FOR TOMORROW'S SDVs

HIGHLIGHTS

Enables reliable, real-time data transport for the architecture components of software-defined vehicles (SDVs), from ECUs to zonal gateways to high-performance compute

Offers an automotive-grade, data-centric software framework to help optimize cost, network distribution, safety and security

Supports broad integration of different automotive platforms in a common architecture, including Time-Sensitive Networking (TSN) support

Provides a safety certification pathway to achieve ISO 26262 ASIL D compliance

Offers cloud-based communications to enable and support the addition of new functionality, such as teleoperations, continuous validation and over-the-air (OTA) updates

RTI Connext Drive® is the communication framework that helps automakers to evolve their electric vehicles (EVs) to a software-defined vehicle architecture. Tomorrow's vehicle designs must be able to overcome communication constraints while providing flexibility, scalability, compatibility and upgradability on different hardware components. To streamline production-readiness, EV manufacturers need a proven pathway to safety certification for their next-generation software-defined vehicles.

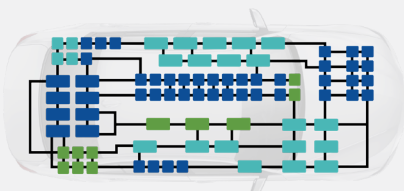**THE FIRST STEP: TRANSITIONING TO THE ELECTRIC ERA**

The rise of electric vehicles (EVs) and the definition of the software-defined architecture (SDA) is even more disruptive to the automotive industry than the introduction of autonomous vehicles (AVs).

Unlike the slower progress of AVs, EVs are taking over: The SDV disruption is happening now, and it's poised to transform the industry. Today's SDVs are predicted to be the pillars of the new electric era. For automakers, the software-defined approach provides innovations that can open up new business opportunities.
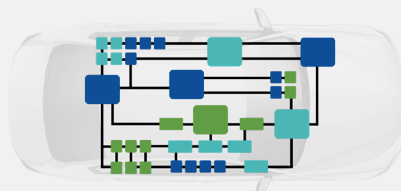
However, next-generation EVs will require significant upgrades to move beyond traditional vehicle architecture in order to address and overcome the major limitations faced by the automotive industry today.

Connext Drive provides the data-centric software framework needed to efficiently manage complexity to integrate new and evolving technologies. Connext can seamlessly support a number of individual solutions, ranging from **zonal architecture** to **high performance compute** and **cloud-based communications**.
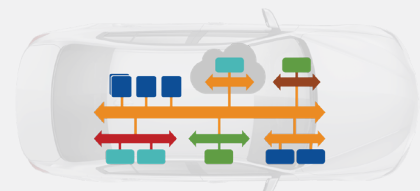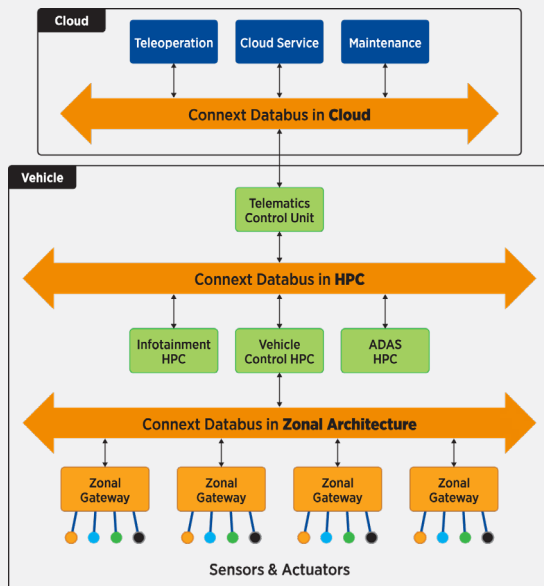

Distributed ECUs   Domain Centralization   Software-Defined Vehicle

THE FUTURE OF SDVs: ECU CONSOLIDATION AND COMPUTING CENTRALIZATION

Centralizing the computing capabilities in one high-performance ECU is enabled by end-to-end communication and data-centric software components. Based on the Data Distribution Service (DDS™) standard, Connext Drive offers a variety of advantages for manufacturers engaged in creating scalable and future-proof SDVs. These benefits include:

- Enabling the given functionality for each vehicle zone: ECUs, central gateway and zonal gateway.

- Simplifying the overall wiring harnesses (currently the third-highest component cost) through TSN support.

- Providing communication libraries certified to the highest functional safety standards (ISO26262 ASIL D).

- Evolving from traditional automotive products into new architectures that include ADAS and telematics applications, making it possible to compete in new markets with dedicated product offerings.

- Providing a proven connectivity framework that is used by ROS 2, AUTOSAR Classic/OSEK and AUTOSAR Adaptive for autonomous vehicles.

THE BENEFITS OF CLOUD-BASED COMMUNICATIONS

The foundational enabler for SDVs is the ability to add new, unplanned functionality, as needed, using cloud-based communications. The cloud provides a cost-effective and readily-available communications channel for SDV applications, especially teleoperations, continuous validation and update capabilities. However, challenges abound. Since the cloud is a shared resource, it is expensive to guarantee dedicated bandwidth for individual endpoints. Meanwhile, the absence of deterministic bandwidth can result in large transmission delays between endpoints. Unbounded latency can add risk for assets and safety.

Connext Drive makes cloud-based communications work to a manufacturer's advantage. It is designed to enable consistently secure communications across public and private networks with ultra-low latency. Connext Drive easily accommodates and supports the demanding communications requirements of cloud-based applications, opening the door to live data streams, such as video from the peripheral sensors or streaming radar and camera data. Connext Drive is an open, interoperable framework that includes all the necessary platform integration tools so that developers can easily interface with market-leading cloud services providers.

REAL-WORLD EXAMPLE

Li Auto: With the development of intelligent in-vehicle systems, communication between components has become more complex and critical. The adoption of advanced sensors such as lidar, radar, etc., alongside the need to support more sophisticated data models and application algorithms, have imposed tremendous challenges in the next-gen E/E architecture. In addition, the requirements of functional safety (FuSa) and cybersecurity must also be considered at the outset of the project. The Connext Drive connectivity framework helps to accelerate Li Auto's EV development in this challenging landscape.

ABOUT RTI

Real-Time Innovations (RTI) is the largest software framework company for autonomous systems. RTI Connext® is the world's leading architecture for developing intelligent distributed systems. Uniquely, Connext shares data directly, connecting AI algorithms to real-time networks of devices to build autonomous systems.

RTI is the best in the world at ensuring our customers' success in deploying production systems. With over 2,000 designs, RTI software runs over 250 autonomous vehicle programs, controls the largest power plants in North America, coordinates combat management on U.S. Navy ships, drives a new generation of medical robotics, enables flying cars, and provides 24/7 intelligence for hospital and emergency medicine. RTI runs a smarter world.

RTI is the leading vendor of products compliant with the Object Management Group® (OMG®) Data Distribution Service (DDS™) standard. RTI is privately held and headquartered in Sunnyvale, California with regional offices in Colorado, Spain and Singapore.

Download a free 30-day trial of the latest, fully-functional Connext Drive software today: **www.rti.com/downloads**.

CORPORATE HEADQUARTERS

Your systems.
Working as one.

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