

CAPABILITY BRIEF

High Performance Compute

ACHIEVING INTEGRATION THROUGH DATA CENTRICITY WITH CONNEXT DRIVE

HIGHLIGHTS

An automotive-grade data-centric software framework that optimizes cost, network distribution, safety and security

Enables reliable, real-time data transport for complex architectures from sensor to high performance compute systems

Supports broad integration of different automotive platforms in a common architecture, including AUTOSAR Classic and AUTOSAR Adaptive, ROS 2 and Time-Sensitive Networking (TSN) support

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

Automotive high-performance computers require systems to consolidate and process large amounts of different data flows to a central location. Existing technologies struggle to provide an optimized solution that covers all requirements with the necessary flexibility. RTI Connex Drive® is the first software framework designed for vehicles that require high-performance, real-time communication.

CONSOLIDATING DOMAINS TO UNLOCK POTENTIAL

Defining and implementing a modern architecture is vital in order to unlock the potential of the software-defined vehicle (SDV). Of course, this will not happen all at once, but rather through a gradual evolution.

This evolution starts with the consolidation of several domains in **High Performance Compute**, (HPC) such as advanced driver assistance systems (ADAS), control, infotainment or telematics, and concludes with the central and zonal gateways approach of next-generation electrical/electronic (next-gen E/E) zonal architecture. Several high-performance computers will coexist in a single hardware component to optimize cost and communication. This functionality is usually composed of different components, such as sensor fusion, localization or infotainment.

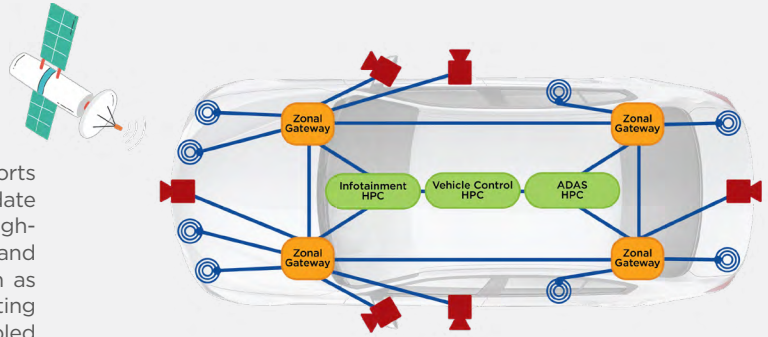
What are the current roadblocks? Legacy E/E architecture is highly complex, due to the exponential growth of actuators, sensors and processing capabilities within resource-constrained environments. In fact, using traditional E/E architectures, based on CAN or Ethernet, can become both costly and a major architectural limitation.

The functionality needed for future software-defined vehicles requires additional sensors and wiring harnesses, which in turn increases the need for intelligent networks and power distribution. In addition, OEMs are under pressure to create flexible, scalable and reliable E/E architectures to satisfy new requirements in the automotive industry.

ACHIEVING ECU CONSOLIDATION AND COMPUTING CENTRALIZATION

The combination of HPC with Connex Drive supports automotive manufacturers who are trying to consolidate processing capabilities in a central computer. The need for high-performance networking efficiently addresses the demand for centralization and transition to new technologies, such as Time-Sensitive Networking (TSN). Centralizing the computing capabilities in the high-performance computer is enabled by end-to-end communication and data-centric software components. Connex Drive offers a variety of advantages for manufacturers engaged in creating scalable and future-proof vehicle architecture. These benefits include:

- Integrating product components and platforms to enable the given functionality for each use case: ADAS, infotainment or control.
- Simplifying the overall wiring harnesses (which is currently the third-highest component cost) through TSN support.
- Supporting communication libraries certified for systems up to ISO 26262 ASIL D.
- Reducing costs, both in terms of components and labor, so that manufacturers can prioritize overall scalability through a data-centric approach.
- Building a flexible, future-proof, in-vehicle architecture despite unknown requirements, such as hardware, capability of autonomy and dynamic updates at deployment.
- Evolving from classic automotive products into new architectures that include ADAS and telematics applications, making it possible to compete in new markets with dedicated product offerings.



DATA CENTRICITY

Connex Drive uses a data-centric approach that allows applications to be integrated easily into the information data model. This data-centric approach also enables the integration and evolution of parallel high-performance computers that are focused on different applications, such as control or infotainment.

Connex Drive directly supports data-centric actions that simplify the overall vehicle design for OEMs, enabling the necessary level of collaboration with automotive Tier-1 suppliers and solution providers to accelerate the path towards continuously evolving high-performance computers. Connex Drive provides the proven, highly-efficient data model design that meets industry requirements.

RTI: DRIVING INNOVATION IN HPC INDUSTRY DEVELOPMENT

RTI is active in many of the leading consortia looking to solve critical problems needed to accelerate the high performance compute systems era, including:

AUTOSAR™

AVC CONSORTIUM

COVESA
Accelerating the future of connected vehicles

SOAFEE

ABOUT RTI

Real-Time Innovations (RTI) is the largest software framework company for autonomous systems. RTI Connex® is the world's leading architecture for developing intelligent distributed systems. Uniquely, Connex 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 1,800 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 Connex Drive software today: <https://www.rti.com/downloads>.

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