DATASHEET

RTI in Autonomous Driving

PROVIDING SAFETY, RESILIENCE AND SECURITY

HIGHLIGHTS

Addresses a wide range of connectivity and integration use cases

Supports communication libraries certified for systems up to ISO 26262 ASIL D

Enables data-level security with full support for confidentiality, integrity and access control

Provides a common interface to different sensor technologies, networks and protocols

Delivers low latency with real-time Quality of Service (QoS) to meet the demands of increasingly complex systems

Provides a data-centric framework that is compatible with major automotive ecosystems such as ROS 2, AUTOSAR Classic/OSEK and AUTOSAR Adaptive

Autonomous car design requires a combination of revolutionary architectures and evolutionary technologies. It must seamlessly integrate multiple vendors, support compliance with evolving standards and enable continuous feature and performance improvements. RTI Connext Drive® accelerates development of robust autonomous driving systems and gives developers an efficient path from prototyping to production and safety certification.

CONNECTING AUTONOMOUS DRIVING

RTI Connext Drive provides core connectivity to autonomous driving applications as well as other safety-critical applications across many industries. It is used through the entire prototyping, development and production process, including safety and security.

A fully autonomous vehicle is essentially a self-driving robot with some of the most demanding safety and cybersecurity requirements in any industry. The Data Distribution Service™ (DDS) standard, which Connext Drive is based on, has its roots in autonomous robotics and is widely adopted by the military, aviation and medical industries for mission-critical and safety-critical systems. DDS has an innate ability to effectively address the fundamental requirements of real-time systems, such as reliability, performance and integration at scale.

Connext Drive is the first automotive-grade safety-certified data-centric communication framework for next-generation vehicles. It can be found at the core of autonomy platforms for leading car manufacturers, as well as in Advanced Driver Assistance Systems (ADAS).

Autonomous vehicle designers can leverage RTI's extensive experience with autonomous robotics, safety-critical systems and state-of-the-art architectures to simplify development, design, integration and certification.

DATA CENTRICITY AND AUTONOMOUS SYSTEMS

Data-centric connectivity is a relatively new concept in distributed systems design. It originated in autonomous robotics and excels at simplifying complex integration and communication between individual robotic components.

Unlike a message-centric model, a data-centric model encapsulates the functionality of data connectivity and provides full visibility of data in motion. It handles most of the functions that a message-centric model requires in an application, greatly reducing the application's complexity.

WHY CHOOSE RTI CONNEXT DRIVE?

Connext Drive addresses the many critical requirements of ADAS and Autonomous Driving applications, including:

- **Real-Time WAN Transport**: The Real-Time WAN Transport feature in Connext Drive provides a foundation for over-WAN communication for the most demanding teleoperation and telematics operations.

- **Quality of Service**: QoS is a core feature of Connex Drive that delivers fine-grained control over data flow and network bandwidth.

- **Built on Data Distribution Service™ (DDS)**: DDS is the proven connectivity standard used by ROS 2, AUTOSAR Classic/OSEK and AUTOSAR Adaptive for autonomous vehicles.

- **Common data model**: A common data model enables applications and systems to share data using a common and well-defined data model across all components.

- **Data-centric architecture**: Data-centric architecture decouples integration logic from system components to simplify collaboration between global teams and suppliers.

- **Scalability**: Connext Drive can be efficiently used for many thousands of applications with hundreds of development teams worldwide.

- **Real-world experience**: Connext Drive has been developed through years of experience supporting customers with demanding industrial applications.

Connext Drive is the only middleware technology offering microsecond latency, ISO 26262 safety certification, fine-grained security and proven operational readiness for revenue-critical, multi-billion dollar automotive product lines.

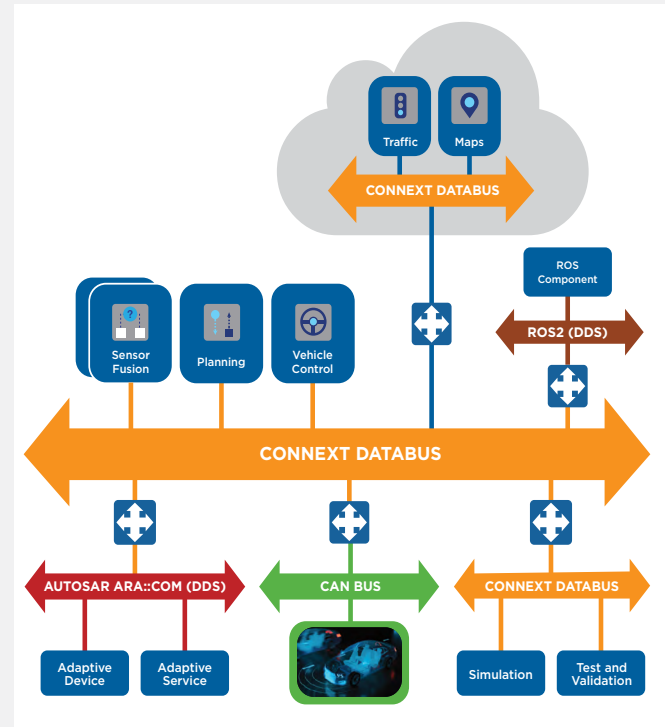To learn more about Connext Drive, visit: rti.com/drive.

Figure 1: A sample autonomous vehicle system architecture using Connext Drive and a layered databus architecture to integrate multiple components and platforms. Connext Drive is the first and only framework to be used in all the common automotive ecosystems.

ABOUT RTI

Real-Time Innovations (RTI) is the largest software framework provider for smart machines and real-world systems. The company's RTI Connext® product enables intelligent architecture by sharing information in real time, making large applications work together as one.

With over 1,500 deployments, RTI software runs the largest power plants in North America, connects perception to control in vehicles, coordinates combat management on US Navy ships, drives a new generation of medical robotics, controls hyperloop and flying cars, and provides 24/7 medical intelligence for hospital patients and emergency victims.

RTI is the best in the world at connecting intelligent, distributed systems. These systems improve medical care, make our roads safer, improve energy use, and protect our freedom.

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 headquarters in Spain and Singapore.

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

**Your systems.
Working as one.**

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