RTI CONNEXT DRIVE

Support for AUTOSAR Classic

INTRODUCTION

The automotive industry is undergoing a transformative shift towards intelligent, connected and autonomous vehicles, creating demand for a new level of sophistication in the design and integration of automotive software. As vehicles become more complex and interconnected, the need for robust and efficient communication mechanisms becomes paramount. In this era of innovation, technologies such as the Data Distribution Service (DDS™) and AUTOSAR Classic have become critical enablers for building resilient and scalable automotive systems.

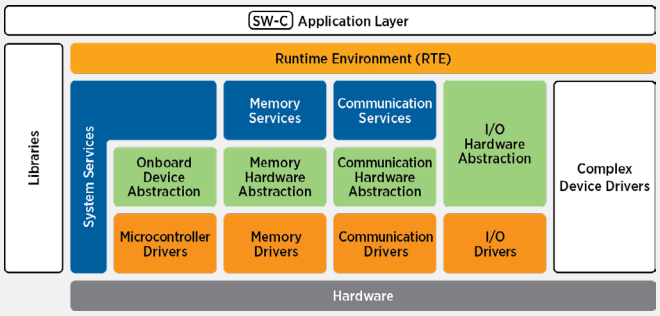

Figure 1: AUTOSAR Classic Layered Architecture

AUTOSAR Classic, rooted in the collaborative efforts of automotive industry leaders, is a standardized software architecture that enables modularity, scalability, and seamless integration within embedded systems. The DDS standard is a communication middleware that facilitates real-time data distribution across diverse domains, leveraging a decentralized publish-subscribe model for robust communication.

The robust communication capabilities of DDS, coupled with the flexibility of AUTOSAR Classic's standardized software architecture, creates an integrated ecosystem that addresses the intricate challenges of modern automotive software development. RTI Connext Drive® is built on the DDS standard and offers users portable, scalable and performant DDS interoperability.

As the developers of the Connext® product suite, RTI has the largest engineering and professional services teams in the world dedicated to DDS. The new RTI Connext® Integration Toolkit for AUTOSAR Classic is now available to Connext Drive users as a complementary product to Connext® Micro and Connext® Cert. It provides a code generation tool that supports automatic conversion of data type definitions across standard formats (OMG® IDL, OMG DDS-XML and AUTOSAR ARXML) and generates supporting C code for data conversion and marshaling data between the Run-Time Environment (RTE) and DDS communication frameworks.

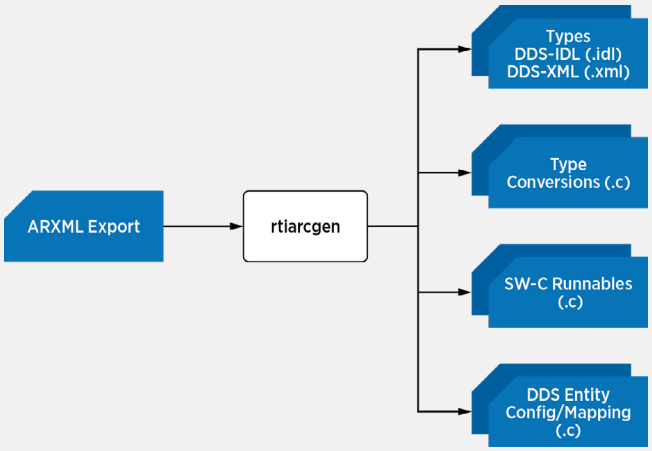

Figure 2: RTI Connext Integration Toolkit bridges from AUTOSAR Classic to DDS

BENEFITS

RTI Connext Integration Toolkit for AUTOSAR Classic combines the AUTOSAR Classic software architecture and methodology with DDS connectivity. It eliminates the need for custom coding through a seamless interface.

AUTOSAR ECU designers define data types, port interfaces and Software Component (SW-C) interfaces using the AUTOSAR ECU design tools of their choice.

Once the design is ready for DDS integration, users can leverage an ARXML export of relevant SW-C models in order for the **AUTOSAR Runtime Complex Device Driver Code Generator** of RTI's Toolkit to produce all the necessary artifacts:

- DDS-compatible type declarations (in either DDS-IDL or DDS-XML formats)
- Type conversion routines
- Data marshaling routines matching the SW-C's runnables
- DDS middleware configuration/mappings module templates

This is an iterative, incremental process that can be repeated — and even automated — as the ECU design grows, allowing DDS interoperability to expand along with ECU design evolution.

RTI Connext AUTOSAR Runtime CDD Code Generator analyzes the type catalog and produces optimized "zero-copy" marshaling routines for most AUTOSAR/DDS type combinations. These components can help designers save execution time, as well as reduce code size.

FEATURES

- ARXML to DDS IDL conversion of AUTOSAR base, implementation, *CompuMethod* and union types
- ARXML to DDS XML conversion of AUTOSAR base, implementation, *CompuMethod* and union types
- Code generation for run-time conversions between DDS and RTE C language type representations
- Code generation for Complex Device Driver Runnables of marshaling routines between RTE provided and/or required PortPrototypes
- Code generation of DDS configuration and RTE mapping module template

INTEGRATION

Integrating AUTOSAR Classic with Connext becomes simple, easily scalable and highly efficient, backed up by extensive documentation and premium expert support. Relying on an already standardized AUTOSAR Classic SW-C, the Complex Device Driver means that the RTI Connext AUTOSAR Runtime CDD Code Generator can integrate into any AUTOSAR Classic solution supporting the SoAd or TCP/IP modules with minimal effort.

Connext Integration Toolkit for AUTOSAR Classic is compatible with AUTOSAR offerings from Elektrobit, ETAS, Siemens and Vector.

RTI provides direct integration to AUTOSAR Classic via the RTI Connext Integration Toolkit for AUTOSAR, with code generation and templates to integrate DDS connectivity into AUTOSAR designs. Please contact your RTI sales representative or visit the website to learn more.

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 software today: https://www.rti.com/downloads.

Your systems. Working as one.

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