LI KYTOnext DDS Improves Complex Communication in Autonomous Vehicles

理想ONE

Li Mu Software Architect, Li Auto October 2021

Who We

Are We design, develop, manufacture, and sell premium smart electric SUVs.

We provide families with safe, convenient, and refined products and services.

AS A DE A BALL

Produc

User Demand Market Focus Competitivene

Technolog

EREV Smart **Solutions User Value**

55

Manufac turing

Supply Chain + Self-owned Manufacturing Base **Quality Control**

Busines Model

Digitalized System Sales and Servicing Network Marketing ficiency

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The 2021 Li ONE

A Smart Electric Vehicle Bringing Happiness to All Families It Serves



standard

configuration

lumbar support and massage functions

Challenges





Autonomous Driving

CAMERAS

Uses parallax from multiple images to find the distance to various objects. Cameras also detect traffic lights and signs, and help recognize moving objects

> **Location Unit** Provide High Precision Position Information

Entertaiment Domain Controller

Requirements in communication

Performance •Low Latency •High throughput •System Critical

Complexity •Multiple Data Sources •Dynamic Configuration •Unstructured Environments •Variable Data Rates







Challenges

Challenges

- A wide range of connectivity and integration requirements
- A common interface to different sensor technologies, networks and protocols
- Low latency
- Available path to ISO26262
- Enables data-level security with full support for confidentiality, integrity and access control
- Meets demands of increasingly large-scale and complex systems



rti

Why RTI Connext DDS?

Easy Deployment

- Data centric pub-sub mechanism
- Offers many platform options
- Support various languages

Safety and Security

- Best-in-industry developer tools (e.g. Recorder, Reply, Logger, Monitor, etc.)
- Safety certification; path to ISO 26262 ASIL-D
- Security; standards-based; fine-grained security

High Performance

- Different choice for different senario, TCP/UDP.....
- Well integerated with TSN
- QoS adapts flows to problem

Best Experience

- >1400 successful customer projects, including mission and safety-critical applications
- >15 years designing architectures for autonomous systems



Why RTI Connext DDS?

• Sensor to cloud Solution





"With the development of intelligent equipment in vehicle, the communication becomes more and more complex. And we can find much more various data sources which were never used in vehicle such as lidar, camera and so on. Meanwhile the application algorithms also vary a lot which show new requirements on communication. FUSA and cybersecurity are also considered. DDS can be a great solution for these issues." Douhan Li, Director

Thanks

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