

# News Release

December 18, 2018

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eSOL Co., Ltd.

## **Launch of ROS 2 Engineering Service Based on Renesas RX65N Microcontrollers for Industrial IoT Systems**

*Helps Expedite Development and Commercialization of Highly Reliable Robotics Systems*

Tokyo, Japan. December 18, 2018 -eSOL, a leading developer of real-time embedded software solutions, today announced that it has launched an engineering service for ROS<sup>1</sup> 2 to support the development of robotics systems that use the RX65N microcontroller for industrial IoT systems from Renesas Electronics Corporation. Drawing on the numerous development projects using ROS/ROS 2 that eSOL has been involved in to date, and its extensive experience in high-reliability embedded systems development, the service will assist with the development of embedded systems based on OSS<sup>2</sup>. This includes considerations like quality assurance and functional safety compliance.



ROS/ROS 2 are open-source robot control frameworks featuring a level of scalability that makes them ideal for implementing complex distributed processing systems. The software has attracted attention in a variety of markets in the past few years, including autonomous driving systems and manufacturing applications that require sophisticated robotic control. Currently under development, ROS 2 incorporates the core concepts of ROS (including distributed processing, a publish/subscribe messaging model, and being programming language agnostic), and adds features required for commercialization and practical implementation. Among these features, it adds support for multi-platform applications (including embedded systems), real-time control, enhanced fault-tolerance, and the ability to control multiple robots. This also includes communication middleware suitable for microcomputers with limited memory that supports DDS<sup>3</sup>-XRCE<sup>4</sup>, a communication protocol currently being formalized as a standard specification.

Renesas appeared again at this year's ROSCon conference for ROS developers, presenting a ROS 2 communications demo in which DDS-XRCE was implemented on a Renesas RX65N MCUs. This enables the development of software for controlling sensors, actuators, and motors located at the endpoint a robot system. Renesas plans to make the source code used in the demo available as open-source in the fourth quarter of 2018. eSOL, meanwhile, intends to launch an ROS 2 engineering service for the RX65N MCUs reusing this software from Renesas. Taking advantage of the know-how and expertise drawn with extensive experience in the development of high-reliability embedded systems, eSOL will provide comprehensive support and quality assurance for embedded systems based on ROS/ROS 2 to facilitate its integration and expedite developments of production-grade systems.



eSOL intends to supply both an engineering service and its "ROS on eMCOS" platform, based on the scalable eMCOS real-time operating system. The engineering service draws on eSOL's extensive experience and expertise to facilitate the use of ROS/ROS 2 in autonomous control systems such autonomous driving and an increasing number of other forms of robotics systems. Similarly, the eMCOS real-time OS is ideal for autonomous cooperative distributed systems, featuring a

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<sup>1</sup> Robot Operating System

<sup>2</sup> Open-Source Software

<sup>3</sup> Data Distribution Service

<sup>4</sup> Extremely Resource Constrained Environments

high degree of affinity with ROS/ROS 2. Together, these overcome challenges like achieving real-time performance and reliability in production-grade including where Functional Safety (FuSa) compliance is a consideration.

#### Service overview

- Engineering service for ROS/ROS 2
    - ROS/ROS 2 application development
    - Integration of ROS/ROS 2 with existing systems
    - Robot control device driver development
    - SLAM prototype development using commercially available robots
    - Research and development of embedded ROS
- and more ...
- Construction of application SDK using characteristics of ROS/ROS 2
  - Providing an eMCOS-based platform with high affinity with ROS/ROS 2

eSOL's experience with ROS/ROS 2 development for embedded systems covers a wide range of applications, from automotive to industrial robots. An autonomous vehicle, demonstrated at Aichi ITS World 2015, used ROS on eMCOS as its autonomous driving platform as part of the open-source Autoware autonomous driving system. Examples of the use of robotics in small embedded systems have included the implementation of an ROS environment on an eSOL real-time OS (compliant with the  $\mu$ ITRON 4.0 specification) and the use of RTPS (one of the communications features in ROS 2). Along with these, eSOL has been involved in several other developments for our customers, including the development of a self-guided robot incorporating a navigation stack, several object recognition algorithms from ROS, implementation of a ROS evaluation system for sensor devices, and a bridge between Windows PCs and ROS to allow for the creation of testing systems for industrial robots.



Mitsuo Baba, Senior Director, Industrial Solutions Business Unit, Renesas Electronics Corporation commented that, “In anticipation of the widespread adoption of service robots in the future, we have become actively involved in the robot development community and are putting a lot of work into strengthening our robotics solutions, including by releasing the source code for running ROS 2 on RX MCU Family. Recognizing eSOL's past involvement with ROS/ROS 2 development as well as its extensive know-how and experience in development in mission-critical applications, we anticipate that its provision of an engineering service for ROS/ROS 2 that is based on our OSS will facilitate quality assurance and faster commercialization in the development of robot systems using the RX MCU Family.”

Futoshi Tokunaga, Vice President and General Manager of Solution Engineering Business, eSOL commented that, “By launching this engineering service for using ROS/ROS 2 in applications such as production machinery or automotive and other mobility systems, eSOL is providing strong support for the use of ROS/ROS 2 in both research and development and in product development targeting commercial-scale production.”

■ For Reference

About eSOL Co., Ltd.

Founded in 1975, eSOL is a leading company in the embedded systems and IoT sector that seeks to create a rich IoT society using its innovative computer technologies. eSOL's software platform products and professional services, centered around its real-time operating system technology, are used worldwide in every field, starting with automotive systems, which conform to the most stringent quality standards, and including industrial equipment, satellites, and digital consumer electronics. In addition to the research and development of its own leading-edge products, and joint research with major manufacturers and universities, eSOL is actively engaged in AUTOSAR and Multi/Many-Core technology standardization activities.

\* Trademark registration for eBRAD is currently pending.

\* Other company or product names are trademarks or registered trademarks of their respective companies.

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