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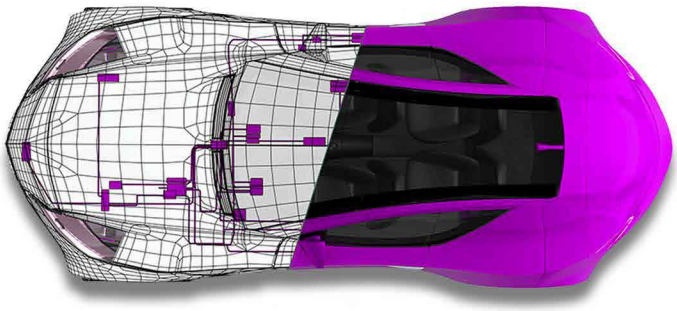
AUTOSAR BASE SOFTWARE (BSW)

and

REAL-TIME ENVIRONMENT (RTE)

Introduction to AUTOSAR BSW & RTE | Understanding the process of BSW & RTE Configuration



AUTOSAR

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A Handbook on AUTOSAR (Part 2)

WHAT ARE BASE SOFTWARE (BSW) AND REAL-TIME ENVIRONMENT (RTE) IN AUTOSAR?

AUTOSAR BSW :

The Base Software, popularly called as the BSW helps facilitates the functions that help achieve hardware abstraction.

The core job of the AUTOSAR Base Software (BSW) is to ensure that the basic functionality of an electronic control unit (ECU) are executed efficiently.

For instance, an application loaded in one automotive ECU may need to interact with other ECUs within the in-vehicle network. AUTOSAR BSW facilitates this inter-ECU communication.(The CAN Interface, CAN NM and TP layers that are integrated with BSW make this communication possible)

Likewise, other functions like memory management, LIN communication, Input/Output etc. are also handled by the AUTOSAR BSW layer.

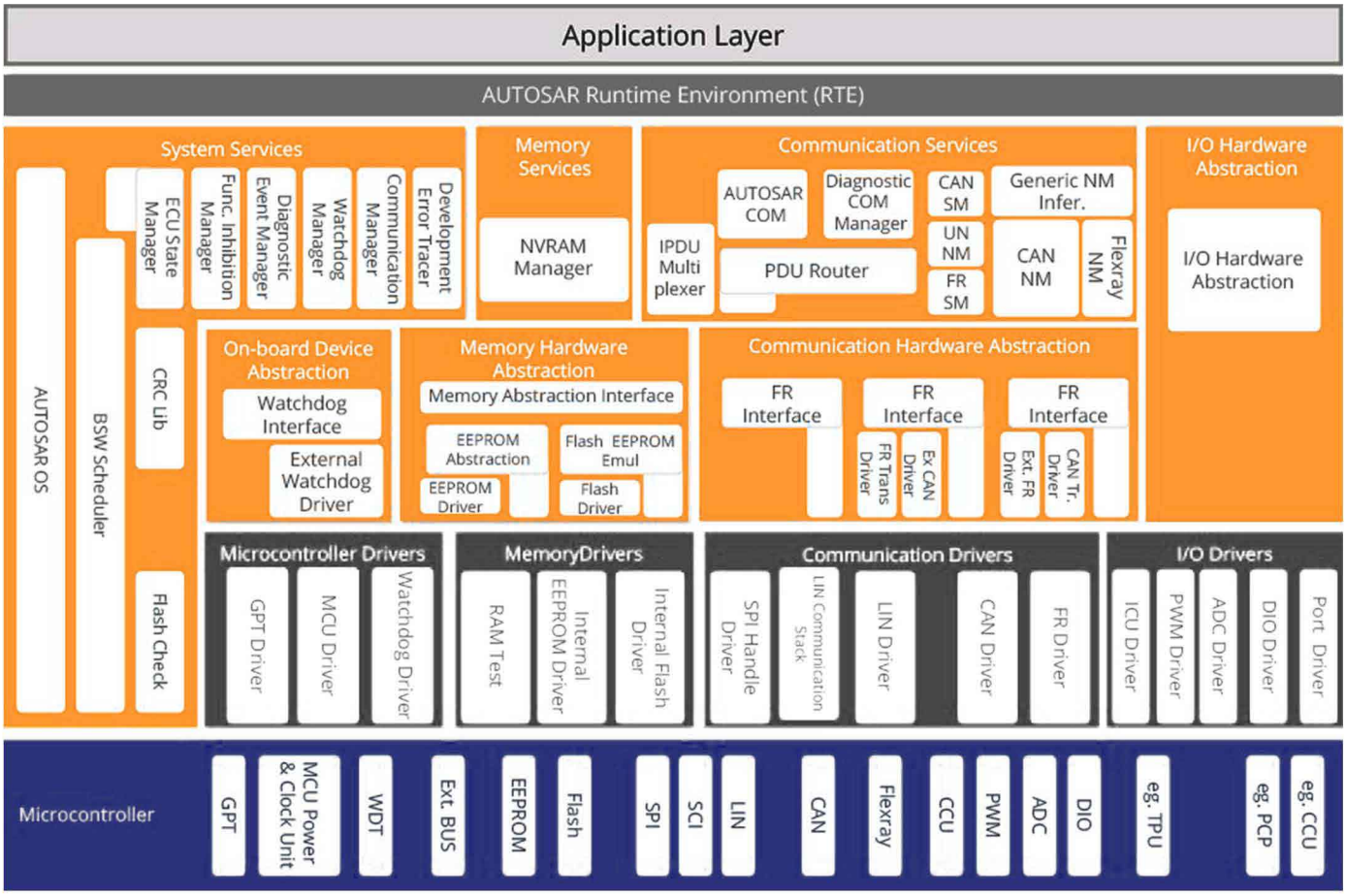
It is the AUTOSAR BSW layer that allows the developers to build applications without worrying about the underlying hardware platform.

Similar to the AUTOSAR MCAL, BSW layer also has to be configured based on specific project requirements.

AUTOSAR RTE :

In a software architecture which is complaint with the AUTOSAR standard, the AUTOSAR RTE (Real Time Environment) is omnipresent!

RTE can be understood as 'A bridge between the Base Software and the Application Layer'. With the help of AUTOSAR RTE, the software components in the Application layer are able to access data and services of the BSW module.



How to Configure AUTOSAR BSW and AUTOSAR RTE?

Manually coding the basic functionality of an automotive ECU, for a specific application, is a time-consuming process.

The AUTOSAR standard has transformed this code development approach to the configuration approach.

In the universe of AUTOSAR, the configuration of Base Software Module implies customization of different software modules, as per the requirement of the project.

For example, A CAN Interface layer (a software module) is configured with the desired Tx and Rx messages, as per the project requirements.

Similarly, a LIN driver also needs similar configuration so that the messages and signals are identified by the BSW.

BSW configuration is performed using tools like DaVinci (Vector), Comasso, EB Tresos Studio and a few others.

Let's understand the process of BSW configuration:

A Step-by-Step guide of the AUTOSAR BSW configuration process:

Step1: A System Description is Required as Input. For instance, for CAN IF Layer configuration, CAN Matrix file in DBC format serves as an input for the tool.

Step2: The tool (used for BSW Configuration) checks the validity of the parameters and the parameter groups. In case of an error, tool recommends some corrections.

Step3: Service ports of the software components along with run-time interfaces of all BSW modules are automatically generated.

Step4: After the validation of the parameters, the configuration source file (.c and .cgf) are created for each BSW module

Step5: The configuration source files are then validated and ECU Description files (.xml) are generated. ECU Description files help in configuration of the BSW modules in other projects with similar requirements.

AUTOSAR RTE Configuration- Inputs and Outputs

AUTOSAR RTE is configured simultaneously, along with Base Software Modules. Similar tools are used for generating the RTE APIs also.

These APIs link the application layer with the OS and manage the communication with the software components and between application layer and BSW.

- **Input for RTE configuration:** ECU Configuration Description (Used for BSW configuration), Software Component Description file
- **Output for RTE configuration:** RTE Source Code (API functions) in .c and .cgf format

Embitel's expertise in configuration of AUTOSAR Base Software (BSW) and AUTOSAR RTE

- AUTOSAR Consulting Services to develop a roadmap for the understanding and implementing the Configuration of BSW and RTE, as per the project requirements
- Integration of AUTOSAR BSW stack (basic software) with the Application Layer.
- Integration of AUTOSAR RTE (Run-time environment) with the Application Layer.
- Expertise in AUTOSAR tools like Comasso, DaVinci Configuration and Code Generation (Vector) and EB Tresos Studio

Hope you enjoyed reading this handbook.
For more queries and/or demos, please contact us at sales@embitel.com

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