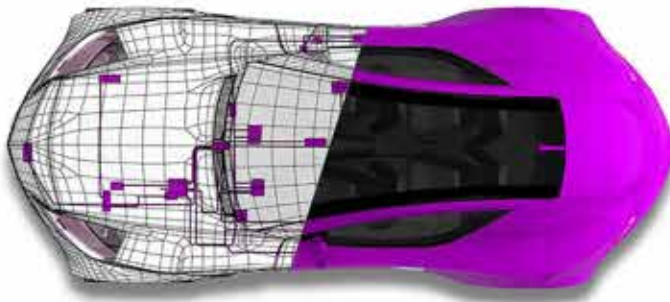


AUTOSAR BASE SOFTWARE (BSW) and REAL-TIME ENVIRONMENT (RTE)

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



*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.

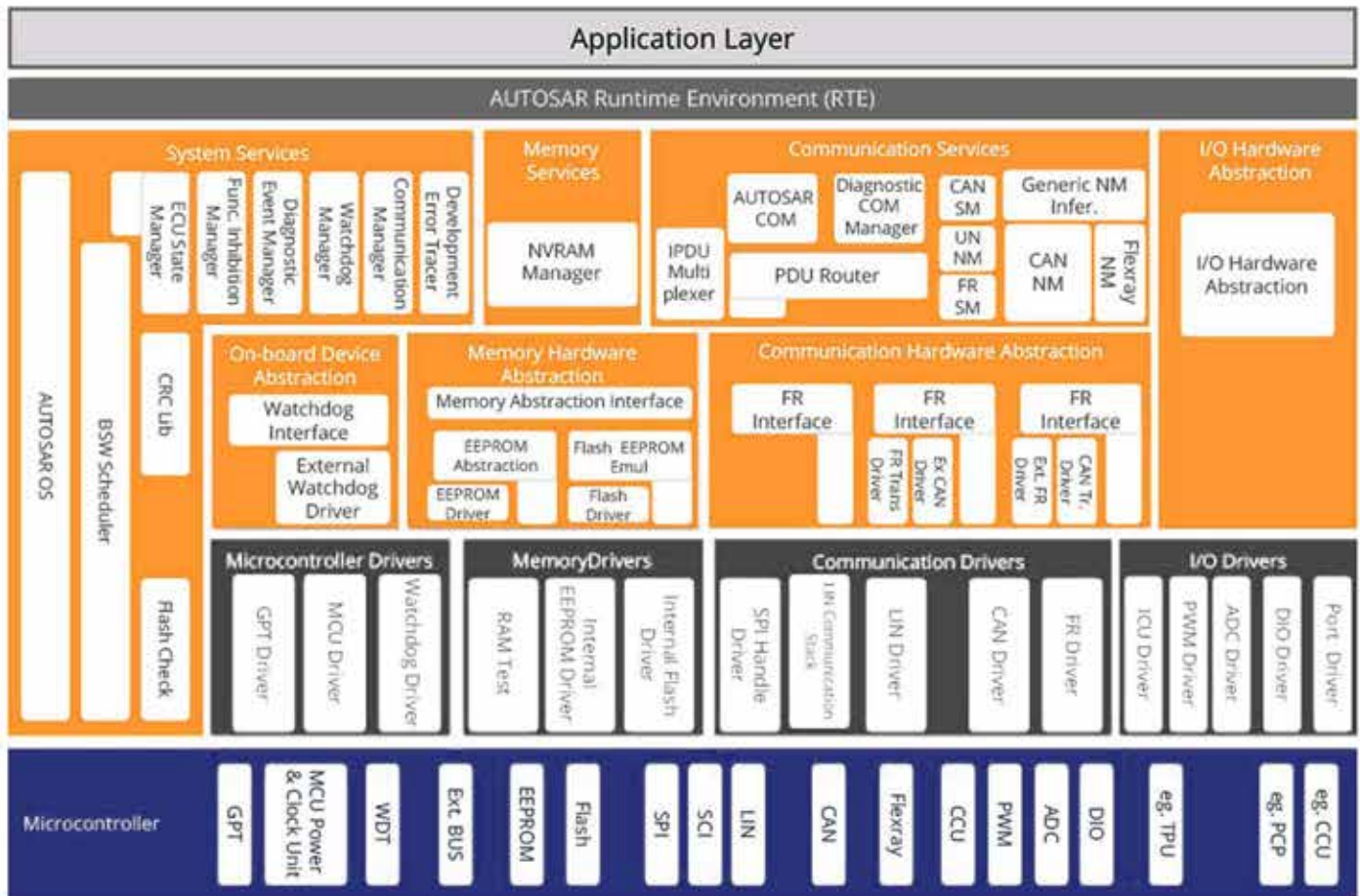
It is the **AUTOSAR BSW** layer that allows the developers to build applications without worrying about the underlying hardware platform.

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 compliant 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
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