AUTOMOTIVE BASICS

Just a collective information..

RTE LAYER

AUTOSAR RTE

The Run-Time Environment (RTE) is at the heart of the AUTOSAR ECU architecture.The RTE is the realization (for a particular ECU) of the interfaces of the AUTOSAR Virtual Function Bus (VFB). The RTE provides the infrastructure services that enable communication to occur between AUTOSAR software-components as well as acting as the means by which AUTOSAR software-components access basic software modules including the OS and communication service.
The RTE encompasses both the variable elements of the system infrastructure that arise from the different mappings of components to ECUs as well as standardized RTE services.

In principle the RTE can be logically divided into two sub-parts realizing:

- the communication between software components
- the scheduling of the software components.

To fully describe the concept of the RTE, the Basic Software Scheduler has to be considered as well. The Basic Software Scheduler schedules the schedulable entities of the basic software modules. In some documents the schedulable entities are also called main processing functions(BSW_MainFunction).

BSW – Refers to the respective module.

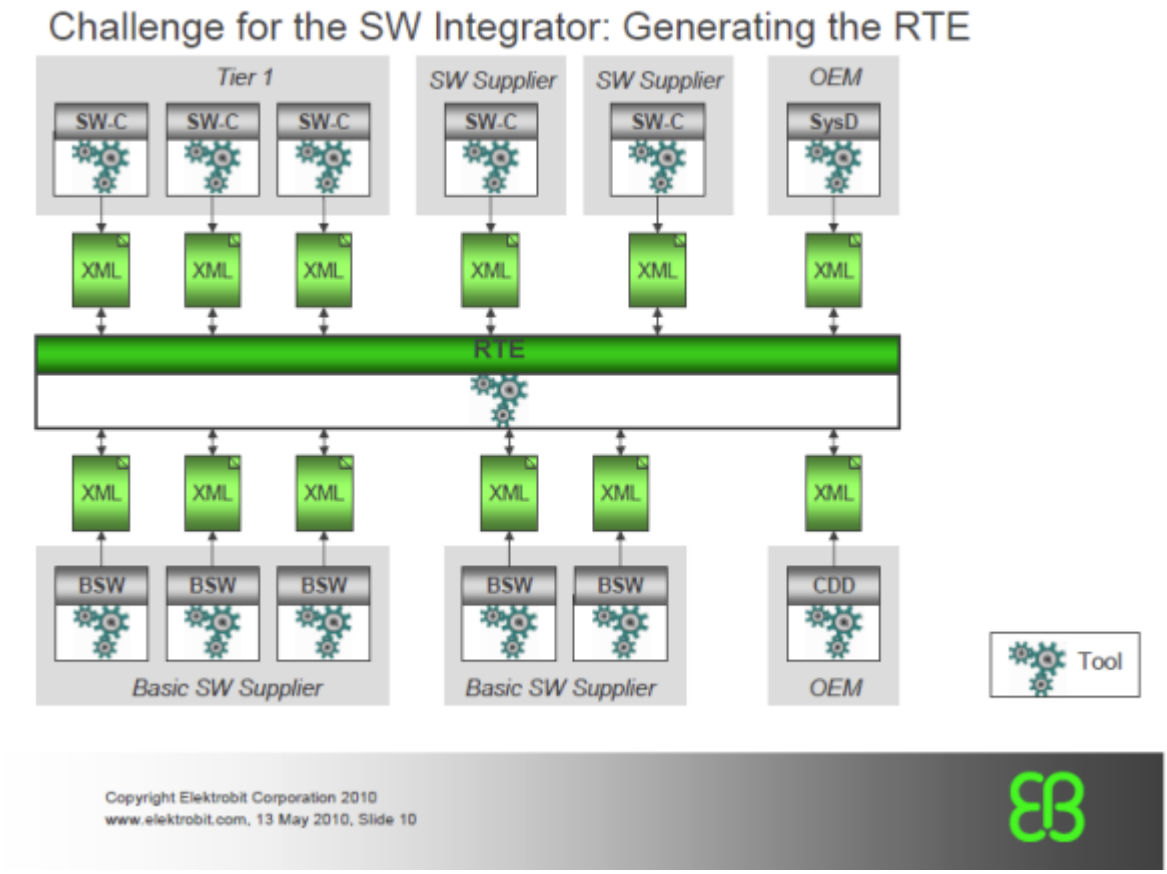
How to do RTE Generation using configuration tools?

In Rte Generation, there are two phases,

1. RTE Contract Phase

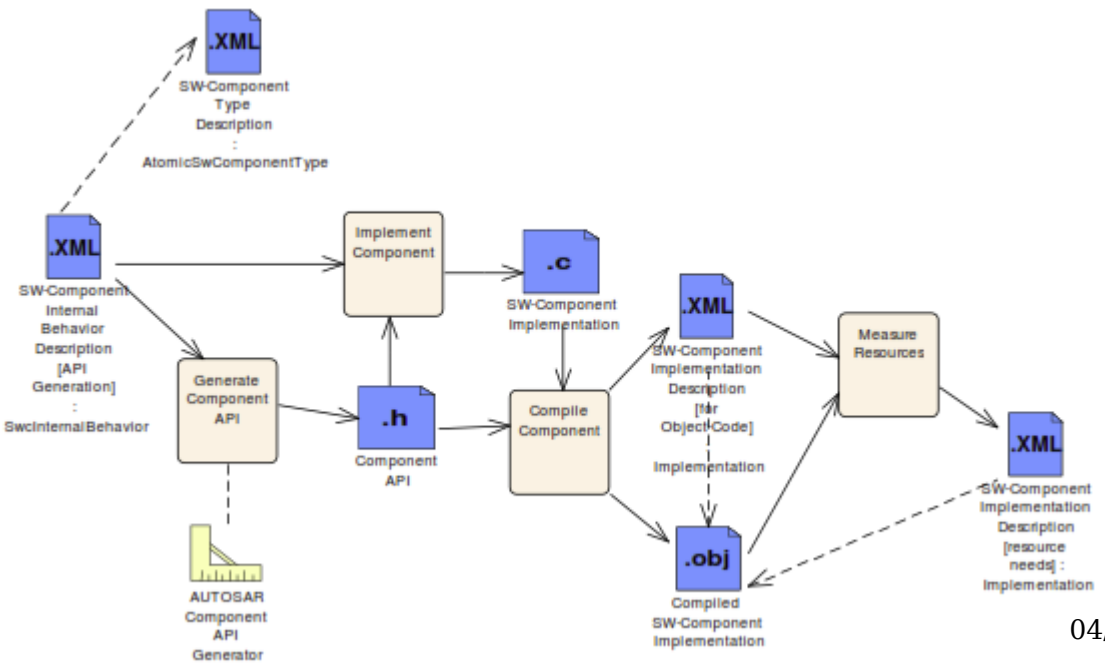
2. RTE Generation Phase

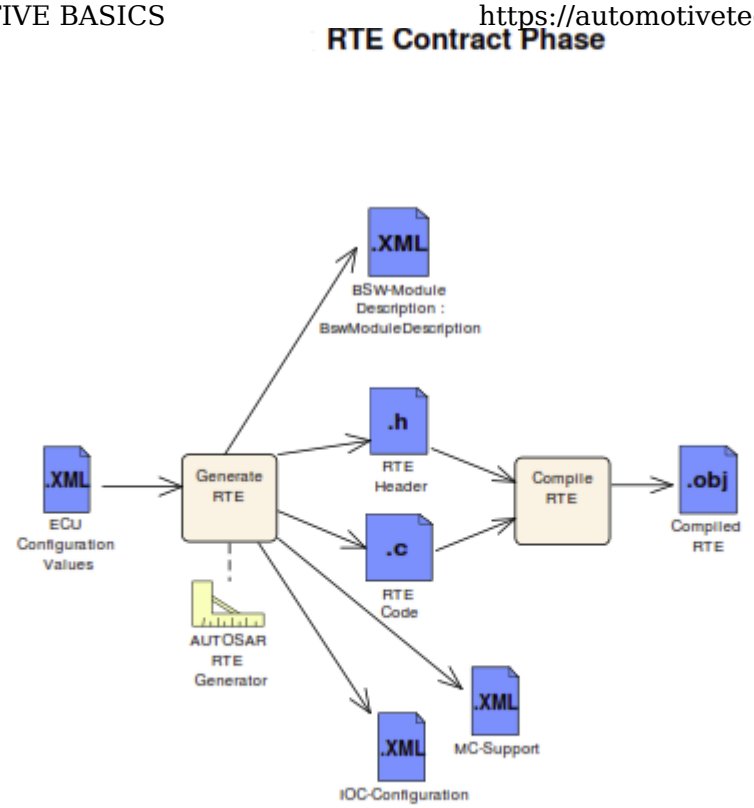
For Rte generation, Each Software component should have Ports(PPorts, RPorts), Interface(Client-Server/Sender-Recevier), Runnables, Rte Events should be mapped to the concern components. In generation of SchM(Schedular Manager) module which will generate the task bodies, BSWMDT(BSW Module Description Template) is the input for the generation of SchM, which is a part of RTE generation.

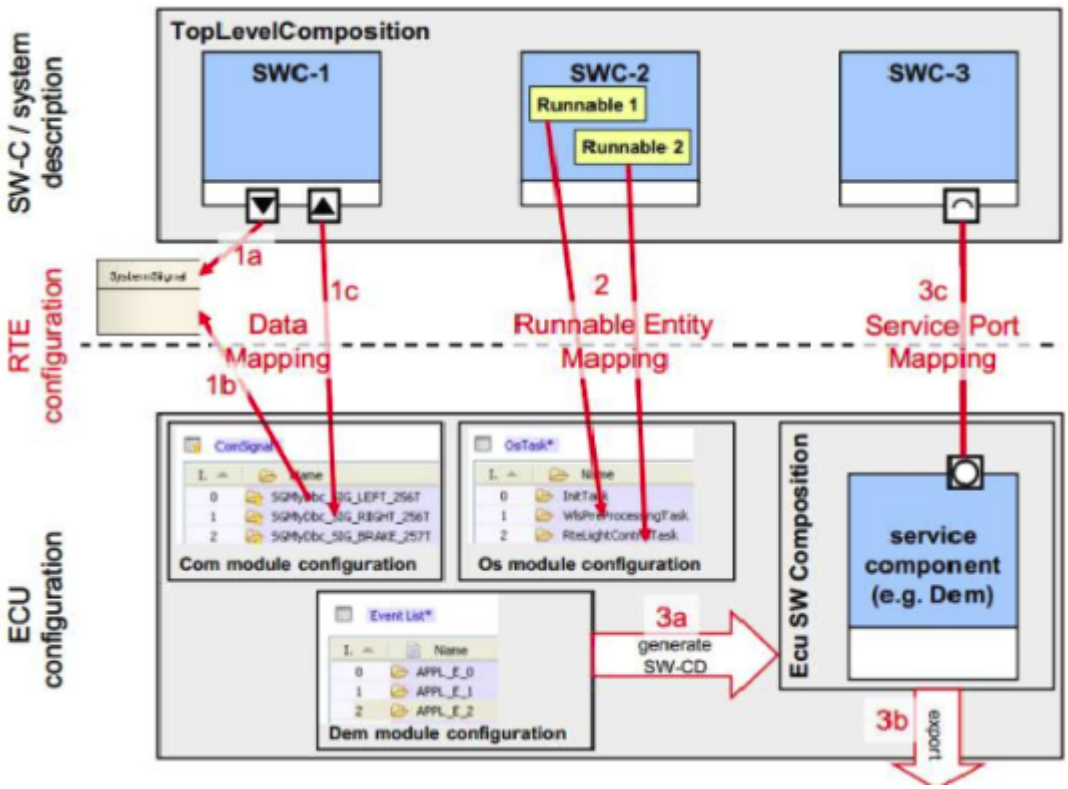


The RTE generation process for SWCs has two main phases:

RTE Contract phase – a limited set of information about a component, principally the AUTOSAR interface definitions, is used to create an application header file for a component type. The application header file defines the "contract" between component and RTE.
RTE Generation phase – all relevant information about components, their deployment to ECUs and communication connections is used to generate the RTE and optionally the IOC configuration. RTE is generated for each ECU in the system.





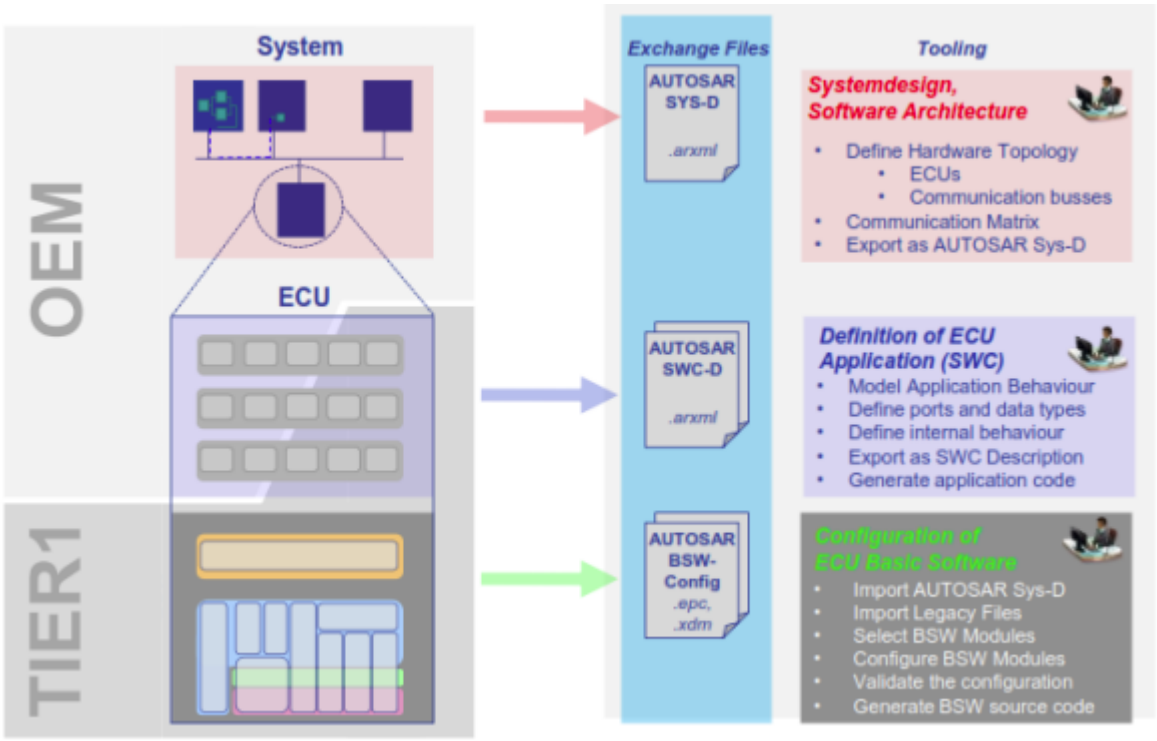


RTE Mapping

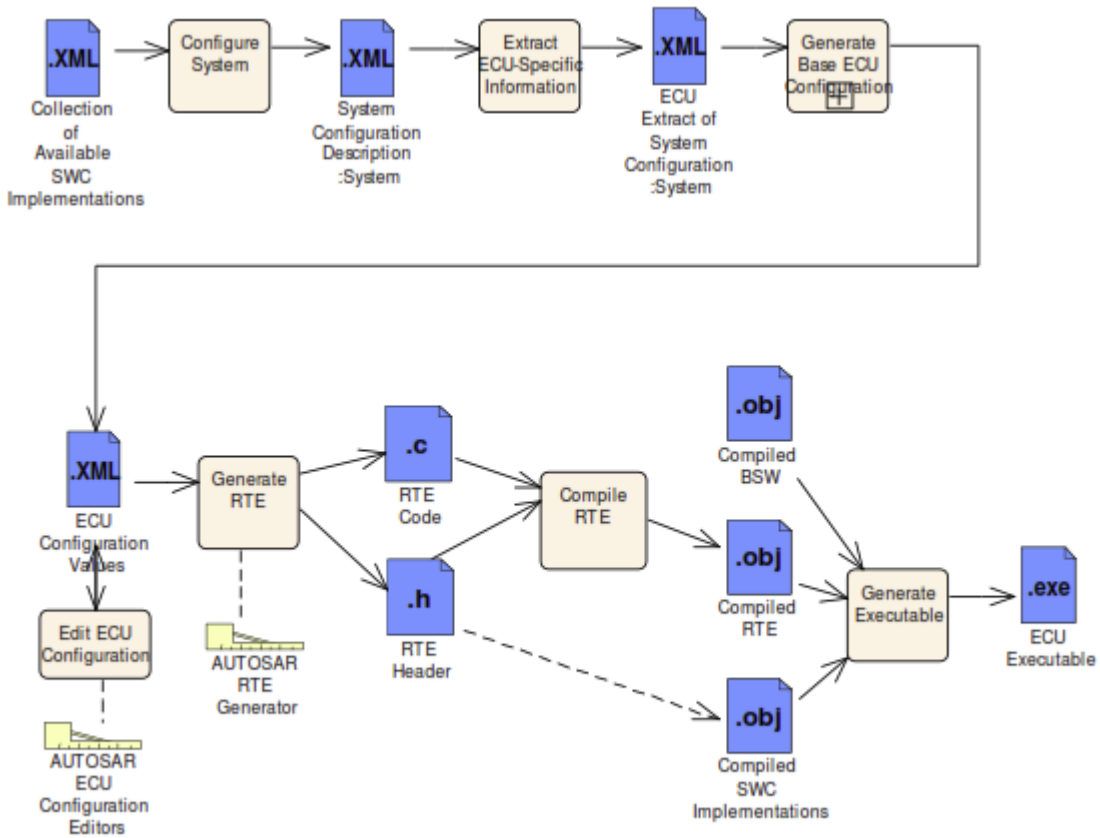
The RTE Generator is used in different roles for the following phases:

- RTE Contract Phase
- Basic Software Scheduler Contract Phase
- PreBuild Data Set Contract Phase
- Basic Software Scheduler Generation Phase
- RTE Generation Phase

- PreBuild Data Set Generation Phase
- PostBuild Data Set Generation Phase



Autosar Methodology



System Build Methodology

6 thoughts on “RTE LAYER”

1. **whildachaq**

   says:
   February 5, 2016 at 7:33 am
   Hello there, I’m a new AUTOSAR learner. You have made a summary from “AUTOSAR_SWS_RTE.pdf”. it’s really good. Actually, I have a ton of questions about AUTOSAR. It is quite difficult to understanding AUTOSAR without take a class from tool vendor or autosar itself. Or maybe just because I’m too dumb.

   In RTE contract phase, Application Header Files will be created. My questions are, How to create Application Header Files? In case I don’t have Component API Generator Tool, what is the important information that I should provide to this phase?

2. **Desingh Mani**

   says:
   March 2, 2017 at 1:38 pm
   The Contract phase generation of files give the connection between one SW Component to RTE Header.
   The Generation Phase is the generation of the RTE files which gives connection between two SW Components or other Service Service SW Components.

   The above is my understanding is it fine let me know if anything is deviated from actual.

3. **sudhakar maradana**

   says:
   March 5, 2017 at 9:48 am
   Yes, you are correct.
   Rte Contract Phase: Generated the only header files & SWC template files.This contains only the function declaration information. Contract Phase can be generated if you have proper ARXML files no need of any mappings.
   Rte Generation Phase: This is the real source code, consists of function body also. This will be generated only after the Data Mapping, Task Mapping, Service Mappings.

4. **Karthi**

   says:
   April 10, 2018 at 12:59 pm
   I am new to automotive domain.How I will know in which function the RTE code starts?

5. **Kevin Lee**

   says:
   May 4, 2018 at 12:23 pm
   Hi There,

   I genuinely do look forward for the time where you post some new write ups. Your blog makes me feel so educated! Continue soaring and writing please.

   A lvalue is an expression to which a value can be assigned. The lvalue expression is located on the left side of an assignment statement, whereas an rvalue is located on the right side of an assignment statement.

   int main(int argc, char *argv[])
   {
   QCoreApplication a(argc, argv);

   int A[3][2]={{1,2},
   {4,5},
   {7,8}};

   int B[3][1]=
   {{0},
   {4,},
   {7,}};

   I want to merge array A and B into a single array C ,which should appear like

   int C= 0 1 2
   4 4 5
   7 7 8

   Thanks a lot. This was a perfect step-by-step guide. Don’t think it could have been done better.

   Thanks,
   Lenord

6. **Irene Hynes**

   says:
   May 18, 2018 at 9:01 am
   Salaam,

   Brilliant article, glad I slogged through the AUTOSAR RTE it seems that a whole lot of the details really come back to from my past project.

   I am new to Linux and have been banging my head against the wall finding the games on my system already and finding the downloaded games. I have the files but they will not open. Please help!

Follow my new blog if you interested in just tag along me in any social media platforms!

Grazie,
Irene Hynes