

*Diploma Thesis Assignment:*

# Implementation of RPC solution for running of arbitrary SW module on embedded HW

**Mentor:**

Jan Svab (TCE Prague, CDV SW Manager, jan.svab@valeo.com)

**About Valeo:**

Valeo is one of the biggest tier-1 automotive components supplier worldwide, active in various areas such as lighting systems, powertrain systems, comfort systems, etc. In TCE Prague our work is focussed on development of ADAS (Advanced Driver Assistance Systems) and driving automation systems.

**Motivation:**

The firmware of modern ECU (Electronic Control Unit) is built from a set of reusable SW modules. Each of these is developed with clearly defined public interface and with emphasis on portability between various CPU architectures. The development of module functionality (the algorithm) is done on the PC, however the resulting code must run with the same results and within given timing constraints on various different embedded targets. The goal of this work this is to be able to run certain parts of ECU firmware on embedded target while the rest of the ECU firmware functionality is still being developed on PC. This methodology has also a wide range of applications in the field of SW testing and validation.

**Assignment:**

Implement complete RPC solution for execution of the SW module source code called in arbitrary PC software on the embedded platform. Verify the created solution by running a given example module code on given MCU board.

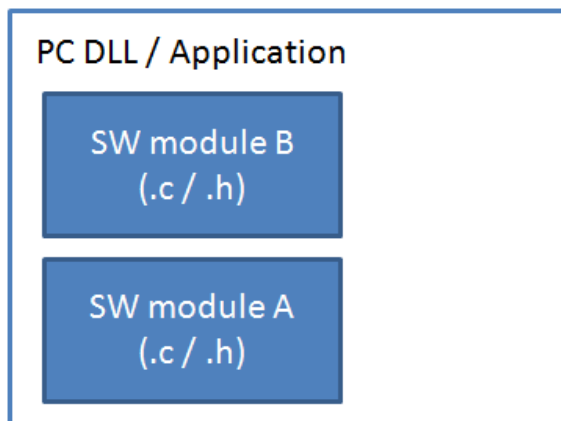


Fig. 1: Block diagram showing two sw modules instantiated in the PC DLL.

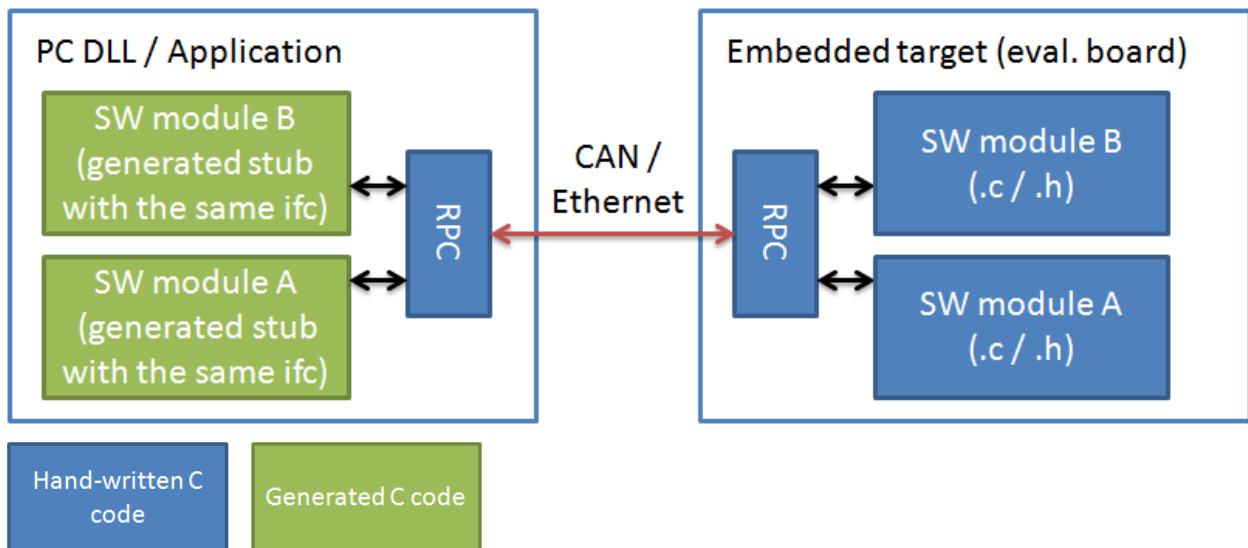


Fig. 2: Block diagram showing desired solution when code called on PC is actually being executed on embedded target MCU on eval board connected via Ethernet or CAN networks.

The student will be provided with the necessary HW/SW equipment (some of it may only be available in TCE) depending mainly on the chosen communication interface. The PC-side has to be realized in C++ for MS Visual Studio (possible use of Qt). The target side will depend on the chosen HW platform. The student will greatly benefit from previous experience with development for embedded target as well as from experience with MS C++.