

Enea - OSE Port

AREA OF COMPETENCES: Embedded Systems and Microelectronic
INDUSTRY: Telco

CHALLENGE

ENEAA

Enea Embedded Technology AB aims to be at the fore-front of the technological challenges and be a promoter and enabler of all new technologies in the automotive industry. They are constantly looking to improve their offering and search for new opportunities.

The MPC5200 CPU on the Lite5200 board from Freescale is targeting the automotive market. A successor to the Lite5200 board will soon be available, Total5200, which in contrast to Lite5200, will offer support for graphics and audio. It is believed that the Total5200 board will render great interest from the automotive industry.

Enea did not have any support for the MPC5200 family, although it did provide a BSP for the Lite5200 board. Main disadvantages were the support only for older versions of OSE (4.x specifically), and the fact that it didn't follow the Device Driver Architecture used by Enea.

As such, Enea decided to employ an external company for porting their proprietary RTOS to this modern board from Freescale.

Our engineers were required to port the OSE from version 4.x to version 5.x, and also create all additional features destined to enhance the board's utility.

SOLUTION

The porting of the OSE was accomplished using various programming languages: C/C++, Assembler – and various additional tools – GCC, Code Warrior, JTAG.

The following drivers have been ported: UART, CAN, Ethernet, IDE/ATA, PCI. At the same time several features have been created especially for this board: Bridge, Timer, PIC.



The OSE RTOS from Enea is a compact, fully pre-emptive, high-availability, multi-processor RTOS designed for distributed, high-performance, multi-channel, multi-function communications applications.

The Lite5200 Board is a compact subset of the Total5200 Development Platform for the evaluation and creation of systems based on the high performance, low-power, low-cost 400 MHz MPC5200 embedded processor containing a PowerPC® core. The board makes the Ethernet, USB, PCI, ATA, serial, CAN, and GPIO resources of the MPC5200 readily available with complete SDRAM and Flash memory support. The I2C, I2S, SPI, J1850, AC97, and secondary port facilities, as well as all other resources of the MPC5200, are all accessible via an on-board connector and user-supplied transceivers. Various combinations of I/O may be traded off, depending on the user's specific needs since nearly all pins of the MPC5200 are re-programmable.

Testing efforts for this project focused on validation of the code added to the initial BSP in order to perform optimally with OSE 5.1. The initial BSP functionality was considered correct and only newly added parts were systematically verified.

We have performed the following types of tests:

- Unit tests – for all new drivers/modifications of existing drivers unit tests were performed.
- System tests - The developer ran and tested all the already released BSP components using the tests described in the test documents. A successful validation was considered only after all unit tests results matched the expected ones.
- Acceptance tests – final acceptance testing was performed with the customer based on a predefined commonly agreed set of tests that validated the full functionality of the board.

Testing the RTOSE required the following hardware and software:

- Lite5200 Board;
- Bootloader (dBUG, POLO);
- Host computer (server);

ABOUT OUR CLIENT

ENEAB AB (Sweden) is a telecommunications specialist with OSE - a real-time operating system that positions it at the cutting edge of technology. The company's software family can mainly be found in radio base stations and mobile telephones, but has also met with success in the automotive and medical technology industries.