Software porting

Porting an existing software system

to the QNX operating system

Customer requirements

The use of the QNX operating system was to be evaluated for the development of future multi-camera systems for vehicles. The target hardware is based on the Zynq SoC from Xilinx. The execution of the feasibility study required that the current version of the existing system was to be ported. As well a modified layout and different hardware components (such as the CAN transceiver) had to be taken into account because the available board support package had been developed for different hardware.

During porting, the entire functional scope had to be considered

The architecture of the entire system was to be retained. Special functions of the currently used operating system were also to be emulated to ensure functionality with respect to temporal behaviour.

The build process of the software was to be based on the existing one.

Technology used

C, C++, Python, QNX, Zynq SoC, MKS, QNX Momentics

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The first step was to put a basic QNX system into operation. In addition to the configuration required by the hardware changes, modifications to the drivers for CAN or Ethernet were also necessary. Test routines were implemented to confirm the functionality of the external interfaces.

The next step was to port the libraries, such as those for the QNX operating system abstraction. Then the individual applications were adapted to the new operating system. The modifications in this context remained very minor. The inter-process communication between the applications using shared memory also had to be recreated.

The design of the individual software components required precise retention of the temporal behaviour of the entire system. The original scheduling and synchronisation behaviour was successfully recreated using the adaptive partitioning technology from QNX.

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