

Project Note

Software Architecture Review for traffic control

Review and improvement of a real-time software system to run on a new hardware platform. Zühlke advised on the adaptation and test of the software architecture to ensure the correct behaviour of a safety-critical system.

Task

VR AG designs, produces and maintains traffic control systems. For a new product generation they needed to port software developed by a partner onto their hardware platform. The new software provides the required new interfaces to the central monitoring systems, but was designed to run on the partner's platform. The main challenge was to adapt the existing software to the own hardware while ensuring the safety requirements. Another goal was to increase the level of understanding in the software to improve the support and further enhancements. VR AG wanted advice on the quality of the partner's software, to measure how well it matched to their specific hardware and requirements, and to compare with alternative approaches. So the task for Zühlke was to perform a technical assessment of the partner's software regarding its real-time behaviour, architectural design and structure.

Implementation

The Zühlke consultant started with a static and dynamic analysis of the software, and used reverse engineering of the source code to document the real-time design. So he gained an understanding of the current behaviour of the existing system. Focus was the finding of changes needed so that the VR AG specific timing requirements could be ensured. Together with the client, the consultant defined the required changes to the run-time behaviour which were then implemented and tested in the new hardware environment. The client and the Zühlke expert could discuss the verification results together, enabling confidence and experience in the operation of the system to be built up. Furthermore, the Zühlke expert coached the VR AG software team in the area of testing and real-time software development.



Technical Data

- C / C++
- VxWorks RTOS
- PowerPC

Customer benefits

- VR AG was able to integrate the new software and realise a new level of complex traffic control systems with the new interfaces and features.
- The results of the assessment and coaching enabled the internal build-up of experience and know-how in the VR AG software team for future development.
- The client profited from access to the specialised knowledge in real-time software and low-level drivers that Zühlke could provide.

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