MICROCONSULT

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RTOS Application: Development of Runtime Architectures for Embedded and Real-Time Systems - Live Online Training

The growing complexity of embedded software applications and the ever increasing performance of hardware has resulted in more and more real-time operating systems being included in software. The use of real-time operating systems poses new challenges for developers.

Objectives

After the RTOS training, you can develop new software runtime architectures and maintain existing ones using sophisticated real-time operating systems (RTOS) - independent of the concrete real-time system product. You are able to document and communicate software runtime architectures and make an informed choice about operating systems.

Participants

The RTOS training addresses programmers, software developers, software designers and software architects who are using or are planning to use a real-time operating system in their embedded software application.

Requirements

Basic knowledge of microcontrollers; knowledge of C programming and typical operating system mechanisms and their functions.

Live-Online-Training

30.07. – 30.07.2026 650,00 € 1 Days

* Price per attendee, in Euro plus VAT

Training code: LE-RTOS-RT

Face-To-Face - English

Duration

1 day

Live Online - German

Date	Duration
30.07. – 30.07.2026	1 day

Face-To-Face - German

Duration

1 day

RTOS Application: Development of Runtime Architectures for Embedded and Real-Time Systems - Live Online Training

More trainings on www.microconsult.com. Subject to change.
All prices per attendee, in EUR plus VAT.
Contact: info@microconsult.com, phone +49 (0)89 450617-71

Content

Embedded and Real-time Software Development Procedure

- From the idea to the final runtime architecture
- Runtime architecture patterns and their use for concrete tasks
- Transformation of an existing software architecture without operating system to an architecture with operating system, with optimized utilization of the OS mechanisms
- Introduction and comparison of different runtime architecture concepts - with and without operating system
- Predictability and calculability of various runtime architecture concepts
- Guidelines for selecting the "right" runtime concept
- Practical example: Measurement device application
- Exercise: Development of a suitable runtime architecture for a real embedded system based on drawn up textual requirements and a software architecture

Multicore and Multiprocessor Aspects

- Hardware and software architectures
- Task assignment
- Possible operating system applications
- Virtualization and hypervisor
- Interrupt and driver concepts
- Important design aspects

Documentation and Communication

- Suitable modeling formats for a runtime architecture
- Excerpts from UML (Unified Modeling Language)
- Practical tips
- Exercise: Using UML notations and diagrams for modeling the runtime architecture

Operating System Abstraction Layer OSAL

- Description of benefits, advantages and disadvantages
- Programming
- Practical example with FreeRTOSTM

Operating System Selection Guidelines and Product Overview

- Operating system selection guidelines
- Practical tip: Operating system comparison
- Current product overview for embedded software
- Checklist with important selection criteria

Practical Exercises

- Development and documentation of a runtime architecture for a convenient electric motor control application using operating system mechanisms
- The exercises are performed using Enterprise Architect (Sparx Systems) or paper and pencil

MicroConsult Plus:

- All participants have the following options to further use their exercises and the solutions developed by MicroConsult from this workshop:
- You e-mail the files to your account, or …
- You get access to file download on request.
- For the measurement device application, you get the program code and a UML model as well as a UML model for the electric motor application.
- You get a tool and software component overview including a current operating system overview
- You also get a checklist with operating system selection criteria.
- You get helpful notation overviews for UML (Unified Modeling Language) and SysML (Systems Modeling Language) in DIN-A3 format.