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Formal Development of a Network-Centric RTOS

Software Engineering for Reliable Embedded Systems

- Uses formal methods to develop Network-centric Real-time Operating Systems
- Unified Semantics provides a solid base for model driven systems development and can be tuned to an application-specific, concurrent programming paradigm
- Methods presented enable model-driven, high-reliability, high-performance software & systems engineering
- Compatible with International Electrotechnical Commission (IEC) 61508, the standard governing functional safety of programmable electronic systems.

Many systems, devices and appliances used routinely in everyday life, ranging from cell phones to cars, contain significant amounts of software that is not directly visible to the user and is therefore called "embedded". For coordinating the various software components and allowing them to communicate with each other, support software is needed, called an operating system (OS). Because embedded software must function in real time (RT), a RTOS is needed. This book describes a formally developed, network-centric Real-Time Operating System, OpenComRTOS. One of the first in its kind, OpenComRTOS was originally developed to verify the usefulness of formal methods in the context of embedded software engineering. Using the formal methods described in this book produces results that are more reliable while delivering higher performance. The result is a unique real-time concurrent programming system that supports heterogeneous systems with just 5 Kbytes/node. It is compatible with safety related engineering standards, such as IEC61508.

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