# Keynote #1: Mastering Security and Resource Sharing with future High Performance Controllers: A perspective from the Automotive Industry

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## Abstract

Consumer-electronic oriented multicore-based SoC designs have entered the automotive market for satisfying higher computing demands foreseen with future in-car applications. Hypervisor technologies offer the opportunity to consolidate existing and brand new SW stacks in a single platform and thereby preserves investments already made into a car's software base. Whilst this trend has targeted mainly HMI-related applications of the cockpit, the road to a completely centralized and non-closed computing infrastructure inside vehicles remains unclear. The use of commodity hardware and new feature-rich software-centric systems, possibly containing open source software appears to be more than challenging as the resulting SW-centric systems need to adhere to strict timing and safety-constraints on top of security constraints commonly accompanying open source based software stacks.

The talk discusses how we as an industry can cope with this revolution where multi-controller oriented compute infrastructures of vehicles are replaced by highly-capable SW centric computer systems. By looking at hardware virtualization and hypervisor techniques the talk builds a concrete example how the next generations of in-vehicle Electronic Control Units (ECU) could look like. Thereby, the talk discloses how massive multicores can be mastered inside future automobiles.

## Bio

Since 2016, Kai Lampka is with Elektrobit Automotive GmbH (limited) and works as a System Architect on Secure Boot and Virtualization of performance-centric multicore architectures. From 2012-2017, Kai was an Assistant, Associated Professor for Embedded Systems resp., at the Information Technology Department of Uppsala University. From 2007 – 2011 he has been a post graduate researcher at the ETH Zurich, Switzerland and he received a Master degree and PhD in Computer Science at the Friedrich-Alexander University Erlangen-Nuremberg, Germany, in 2001 and 2007, respectively. Prior to this studies in Computer Science at the Friedrich-Alexander University Erlangen-Nuremberg, Germany (1995-2001), Kai Lampka studied Business administration at the International Business School Lippstadt and secluded this with a respective degree.

Kai Lampka obtained the "ACM SIGBed Best Paper Award" at the "Int. Conference of Embedded Software" (EmSoft) in 2009 and the "Best Paper Award" at the bi-annual Conference "Measurement, Modelling and Evaluation of Computing Systems" (MMB) in 2006.
Kai is/has been a TPC member of FORMATS, QEST, DATE, LCTES and RTAS, a TPC Topic Chair for DATE 2018 and a regular reviewer to several international journals on embedded systems and formal methods. In the past Kai has also been an area editor for the int. journal on electronics and communications (Elsevier).