Resource Management for Multicore Aware Software Architectures of In-Car Multimedia Systems

Andreas Knirsch¹², Joachim Wietzke¹, Ronald Moore¹, Paul S. Dowland²

¹ In-Car Multimedia Labs, Faculty of Computer Science, University of Applied Sciences Darmstadt, Schöfferstr. 8b, D-64295 Darmstadt {andreas.knirsch, joachim.wietzke, ronald.moore}@h-da.de

² Centre for Security, Communications and Network Research (CSCAN), University of Plymouth, Plymouth, PL4 8AA, United Kingdom info@cscan.org

Abstract: With increasing hardware capabilities the demands on the functionality of user-centric systems continuously expand. The next generation of automotive embedded systems is going to make use of multicore hardware architectures, which strongly enhances the computational power. This means a movement from concurrent to parallel computing. Although the competition for CPU time will decrease, other resources are not available in multiple instances. This raises the need for a management unit that controls access to resources other than the CPUs. Such a resource manager is able to utilise the capabilities of multicore hardware architectures for component based software systems more predictably. This paper builds a case for a resource scheduler, identifies requirements and provides details of a prototype implementation. As an illustrative example, the domain of automotive multimedia/infotainment systems is used.