

A Compilation- and Simulation-Oriented Architecture Description Language for Multicore Systems

(Invited Paper)

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Abstract—Today’s reconfigurable multicore architectures become more and more complex. They consist of several processing units, not necessarily identical, different interconnecting modules, memories and possibly other components. Programming such kind of architectures requires deep knowledge of the underlying hardware and is thus very time consuming and error prone. On the other hand, automated toolchains that target multicore architectures are typically tailored to one specific architecture type and require a platform-specific programming model. Within the EU FP7 project *Architecture oriented parallelization for high performance embedded Multicore systems using scilAb* (ALMA) we address this shortcoming by a flexible toolchain featuring platform-independence on the architecture level as well as on the programming model. Thus, the toolchain is kept retargetable by using a novel architecture description language (ADL) for multi-processor system on chip devices. Applications are expressed using the Scilab programming language allowing the end user to develop optimized programs without specific knowledge of the target architectures. Thereby, the ADL guides the code generation of the integrated toolflow through coarse- and fine-grain parallelism extraction, parallel code optimizations and multicore simulations.