

Design issues in the development of a JAVA-processor for small embedded applications

Hagen Ploog, Tino Rachui, Dirk Timmermann

Department of Electrical Engineering and Information Technology
University of Rostock, Germany
email : hp@e-technik.uni-rostock.de

Abstract

This poster presents some design issues in the development of a JAVA-processor according SUN's JavaCard 2.0 API for use in small embedded applications which could be realized with FPGAs. We employed this API because threads and garbage collection are not defined within this specification which leads to small area requirements. As our current solution is microcode-based we demonstrate that the footprint of the Java-processor can be reduced when using loosely coupled state machines (a microcode-sequencer and three slave state machines). Each slave state machine can HALT the microcode-sequencer while itself is still running. Furthermore we discuss some architecture details on implementing the stack on such systems as Java machine implementations are stack-based computer architectures.