

1. Record Nr.	UNINA9910138912903321
Titolo	2009 IEEE Computer Society Annual Symposium on VLSI
Pubbl/distr/stampa	[Place of publication not identified], : IEEE, 2009
ISBN	9781509074792 1509074791 9780769536842 0769536840
Descrizione fisica	1 online resource
Disciplina	004.21
Soggetti	System design
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Sommario/riassunto	Scratchpad memories (SPMs) are promising for energy-efficient embedded systems. Most optimizing techniques for mapping data and code elements to SPMs assume the availability of source code. However, embedded software development has to cope with legacy code, third-party software, and IP-protected applications for which only the binaries are available. The few techniques that directly handle binaries operate on executable files and are limited to either code or data. This work proposes a new technique that addresses both data and code allocation into SPMs. Since it operates directly on binaries, the technique allows library elements to be eligible for SPM mapping. It consists of three main engines: a profiler, a mapper and a patcher. The patcher was designed to operate upon relocatable object binaries so as to overcome the inefficiency of bookkeeping SPM relocations on executable binaries. As compared to code-only SPM mapping, an average energy saving of 15% was obtained for a varied set of benchmark programs and memory configurations. Savings around 47% were reached for the two programs with higher static data content. The average patching time was 0.23s on a quad-core workstation.