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International Journal of Computer Applications
© 2011 by IJCA Journal

Volume 36 - Number 8

Year of Publication: 2011

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10.5120/4514-6384

{bibtex}pxc3976384.bib{/bibtex}

Abstract

Energy consumption in caches is widely studied topic. The access to a cache line consumes energy. This paper proposes exclusive cache model that reduces the energy consumption over the tag cache model. The proposed model assumes two level exclusive cache with tag cache in level one. The tag cache consists of tag information of all cache levels. It is stored in cache in level one. An address is checked in tag cache and the corresponding line is accessed. On miss, the line is placed as in exclusive cache case updating the tag cache. The proposed model compares subsets of tag during address mapping. This turns on selectively the comparison circuitry in tag cache selectively saving energy consumption. A mathematical model is developed for the proposed model. The proposed model is simulated with SPEC2000 benchmarks. The average memory access time is comparable with tag cache with energy saving of 7%.

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Index Terms

Computer Science

Computer Architecture

Keywords

Average memory access time

Energy consumption

Set associative

cache

tag cache

