

研发、设计、测试

针对能耗热点的SPM静态分配管理策略

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摘要 综合考虑程序的指令块、数据块、全局变量对程序执行能耗的影响, 使用带权重扩展控制流图 (WECFG) 将应用程序划分成各类逻辑节点, 通过SPM平均访问能耗值计算出逻辑节点平均能耗, 以及各逻辑节点的能耗密度。以能耗热点为依据构造SPM分配的整数线性规划算法 (ILP), 转化成以能耗密度为优先权的0-1背包算法。仿真结果表明, 使用该分配策略的SPM空间分配, 比不使用SPM时的能耗量平均减少34.8%左右。

关键词 [能耗热点](#) [片上存储器](#) [静态分配策略](#)

分类号 [TP302](#)

Static allocation management strategy for SPM based on energy hotspot

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Abstract

In this paper, a static management allocation strategy for scratchpad memory is proposed based on the energy hotspot of application. With instruction, data and global variable, this method transforms the application into a graph consisting of many distinct nodes based on WECFG, then computes the nodes access energy consumption and the nodes energy density, if nodes is placed in SPM, by SPM's average access energy consumption. It converts the Integer Linear Programming (ILP) problem of SPM static allocation to a 0-1 backpack problem. Experiments show that this approach reduces about 34.8% energy consumption than that system without SPM.

Key words [energy hotspot](#) [scratchpad memory](#) [static allocation strategy](#)

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