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SYSTEM PERFORMANCE OPTIMIZATION USING EFFICIENT OPTIMAL CACHE MANAGEMENT POLICY

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Abstract

Different workloads and program phases (access patterns) have different locality characteristics and a verity of cache replacement policies have been proposed for different situation. However, previous research has shown that one replacement policy usually performs efficiently under the workload with one kind of access patterns, it will perform badly once the access patterns of workload changes and, no one replacement policy perform well to mix access patterns. In this paper, we have proposed Efficient Optimal Replacement Policy (EORP) in order to reduce the number of cache misses and optimize cache performance for mix access patters. EORP evict the pages which are not likely to be accessed again. Finally, we have simulated EORP with variety of access patterns, compare it with all traditional replacement policy as well as researchers replacement policies like WRP, CRFP, & IRP. We have shown that EORP outperforms other policies in many cases and performs the best or equal in most of the cases without imposing major computational as well as memory overhead.

Keywords: LRU, LFU, MRU, IRP, WRP, CRFP, EORP.