Adapting ACME to the Database Caching Environment

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Abstract

The field of database cache replacement has seen a great many replacement policies presented in the past few years. As the challenge to find the optimal replacement policy continues, new methods and techniques of determining cache victims have been proposed, with some methods having a greater effect on results than others. Adaptive algorithms attempt to adapt to changing patterns of data access by combining the benefits of other existing algorithms. Such adaptive algorithms have recently been proposed in the web-caching environment. However, there is a lack of such research in the area of database caching. This thesis investigates an attempt to adapt a recently proposed adaptive caching algorithm in the area of web-caching, known as Adaptive Caching with Multiple Experts (ACME), to the database environment. Recently proposed replacement policies are integrated into ACME's existing policy pool, in an attempt to gauge its ability and robustness to readily incorporate new algorithms. The results suggest that ACME is indeed well-suited to the database environment, and performs as well as the best currently caching policy within its policy pool at any particular point in time in its request stream. Although execution time increases by integrating more policies into ACME, the overall time saved increases by avoiding disk reads due to higher hit rates and fewer misses on the cache.

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