Abstract

Generation of Specialized Cache Expiration Rules by Static Analysis of Workflows for Memory Reduction

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Business Process Management is getting attention in enterprises to adapt to rapid changes in business environments. Several workflow engines provide this capability by storing the large number of statuses of the business activities in a database. Frequent query requests to the large database potentially become a performance bottleneck. To prevent it, self-maintainable views (a sort of database replication technologies) can be used as cache to offload the query workload from the database server to the application side. However the self-maintainable views are often too large to keep in memory and generic methods to conserve memory are not always sufficient for this usage of self-maintainable views. In this presentation, we describe a new method for generating specialized expiration rules to remove unused data in a self-maintainable view. We employ the static program analysis approach to determine the optimal evaluation timing for the expiration rules in a given workflow. Analyzing the workflow allows earlier data removal than the generic expiration method. It efficiently helps to reduce the memory, because the memory consumption depends on the life time of the data. In our simulation based on concrete business scenarios, our method could save about 60% to 90% of the memory compared to a generic approach.

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