Summary Part 1
An Analysis of Database Workload Performance on Simultaneous Multithreaded Processors

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What are the problems solved by this paper?
This paper examines the suitability of SMT processors for executing database workloads. Since database systems have poor cache performance and multithreading can worsen the situation, the paper analyzes the memory behavior of databases running on a SMT processor. The authors pinpoint the cache related problems that can occur and provide solutions to mitigate these problems.

What are the approaches attempted by this paper?
To avoid the destructive cache interference between different threads, they propose two solutions:

• using appropriate page mapping policy in the OS (bin hopping vs. page coloring)
• offsetting the similar data structures of different threads so that they will have different virtual addresses and will not conflict in the cache.

What are the main conclusions of this paper?
Though the memory footprints of the DBMS workloads are large, there is a lot of reuse, which produces small, cacheable ‘working sets’, provided that cache conflicts between threads can be minimized. With proper software page mapping policies, the cache behavior of DBMS workloads on a SMT is comparable to that of a single threaded processor. SMT can tolerate latency much better than a single threaded processor, so if cache conflicts are reduced to the levels found in single threaded processors, then SMT can give substantial performance improvement for DBMS workloads.