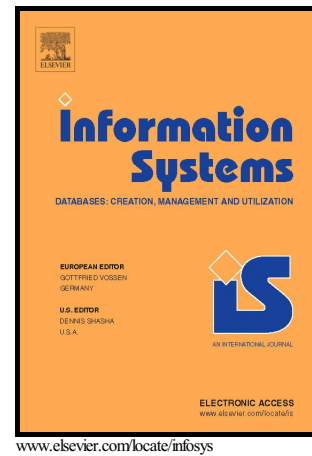


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An Empirical Study of Transaction Throughput Thrashing Across Multiple Relational DBMSes

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Abstract

Modern DBMSes are designed to support many transactions running simultaneously. DBMS thrashing is indicated by the existence of a sharp drop in transaction throughput. Thrashing behavior in DBMSes is a serious concern to database administrators (DBAs) as well as to DBMS implementers. From an engineering perspective, therefore, it is of critical importance to understand the causal factors of DBMS thrashing. However, understanding the origin of thrashing in modern DBMSes is challenging, due to many factors that may interact with each other.

This article aims to better understand the thrashing phenomenon across multiple DBMSes. We identify some of the underlying causes of DBMS thrashing. We then propose a novel structural causal model to explicate the relationships between various factors contributing to DBMS thrashing. Our model derives a number of specific hypotheses to be subsequently tested across DBMSes, providing empirical support for this model as well as important engineering implications for improvements in transaction processing.

Keywords: DBMS Thrashing, Transaction, Throughput, Factors, Structural Causal Model, Empirical Study

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