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A performance evaluation of distributed database architectures

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Abstract

The globally integrated contemporary business environment has prompted new challenges to database architectures in order to enable organizations to improve database applications performance, scalability, reliability and data privacy in adapting to the evolving nature of business. Although a number of distributed database architectures are available for choice, there is a lack of an in-depth understanding of the performance characteristics of these database architectures in a comparison way. In this paper, we report a performance study of three typical (centralized, partitioned and replicated) database architectures. We used the TPC-C as the evaluation benchmark to simulate a contemporary business environment, and a commercially available database management system that supports the three architectures. We compared the performance of the partitioned and replicated architectures against the centralized database, which results in some interesting observations and practical experience. The findings and the practice presented in this paper provide useful information and experience for the enterprise architects and database administrators in determining the appropriate database architecture in moving from centralized to distributed environments. Copyright (c) 2012 John Wiley & Sons, Ltd.

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