A Novel Recovery Scheme for SQLite Based on Logical Logging

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Abstract

SQLite is a popular relational database management system (RDBMS) mainly used in local application, embedded device, and smartphone. In order to preserve transactional atomicity and durability, SQLite uses recovery schemes that are based on physical logging. Physical logging generates large log file, because whole page is stored even if only a small portion of page is modified. Therefore, log maintenance cost of physical logging is expensive, and it causes delay in applications that use SQLite. In this paper, we propose a new recovery scheme for SQLite, Delta-WAL. Delta-WAL is a recovery scheme based on logical logging, and reduces log size by storing only operation code and input values. In experiment, Delta-WAL generated smaller log compared to existing recovery schemes, and also showed improved transaction throughput.

Keywords
SQLite, recovery scheme, logical logging, DBMS

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Received Oct 28, 2014, Revised Nov. 17, 2014, Accepted Nov. 20, 2014

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