Abstract

This paper presents Shadow, Piggy bag, Elemental External Dependency Inversion and in Time Yielding (SPEEDITY) commit protocol for distributed real time database systems (DRTDBS). Here, only abort dependent cohort having deadline greater than a specific value (Tshadow_creation_time) needs to forks off a replica of itself called a shadow, whenever it borrows dirty value of a data item. Commit-on-Termination external dependency between final commit of lender and shadow of its borrower and Begin-on-Abort internal dependency between shadow of borrower and borrower itself are defined. Due to heavy delay in commitment of lender in the case of update-read conflict, execution of borrower is started with its shadow by sending YES-VOTE message piggy bagged with the before value [11] to its coordinator after aborting it and abort dependency created between lender and borrower is reversed to commit dependency between shadow and lender with read-update conflict and commit operation governed by Commit-on-Termination dependency. The performance of SPEEDITY is compared with shadow PROMPT, SWIFT and DSS-SWIFT commit protocols [6, 22, 23] for both main
memory resident and disk resident databases with and without communication delay. Simulation results show that the proposed protocol improves the system performance up to 5% as transaction miss percentage.

Reference


Index Terms

Computer Science

Database Management System

Key words

Distributed Real Time Database System

Commit Protocol
Conflict Resolution

Dependency Inversion