MS CS THESIS

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PPP: Parallel Parity Processing Based on Multiple Parity Channels

Abstract

Nowadays, RAID storage dominates an extremely position on the storage market. However, its parity-handling overhead for reliability is significant for its sequential parity writes on only a single parity channel of standard RAID4. In view of this, PPP: Parallel parity processing based on multiple parity channels is proposed to relieve pressure of parity processing from two aspects. One is to use multiple parity channels to process parity in parallel. The other one is to utilize the time interval between requests to process parity. Via trace-driven simulation, the performance of PPP with two, three and four parity channels for trace TPC-C and Exchange is improved by 7.17%, 3.11%, 5.07% and 7.12%, 6.12%, 4.75% respectively. This paper demonstrates the possibility and advantage of PPP.

Thesis Committee

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