Data-Intensive Scalable Computing Laboratory (DISCL)

Technical Report

Department of Computer Science

Texas Tech University

Rethinking RAID for SSD based HPC Systems

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Hybrid-RAID (HRAID)

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Abstract

The emerging Solid State Drives (SSDs) have changed the landscape of storage systems and have the potential to be widely deployed in computing systems including HPC systems. However, the cost and the capacity of SSDs have often been cited as the primary barrier to SSD deployment. In this study, we revisit the RAID design and propose new hybrid-RAID (HRAID) architecture to explore the low-cost and high-capacity merits of HDDs and the low-latency and high-bandwidth merits of SSDs. The initial results show the promise of the proposed HRAID architecture in terms of the reliability, performance, cost, and capacity.

Keywords: *HRAID, Hybrid-RAID, SSD-RAID, GPU Parity, SSD usage-aware optimization.*