

Next Generation of Storage Engine via FPGA Accelartion

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ABSTRACT

Due to increasing write-intensive workloads ratio, update in place databases suffer from poor write throughput. To address this issue, more and more modern storage engines employ a write-optimized structure like LSM-tree. LSM-tree reduces write amplification by batching the updates in memory and cascading the changes to durable storage. To make up for the read/scan deterioration, LSM-tree resort to maintaining a background compaction to merge key-value entries and recycle historical versions. However, compaction is a computation-intensive operation which is prone to result in a jitter of database system. In this paper, we propose a novel hybrid CPU-FPGA storage engine, with dedicated hardware that performing compacton. Our experiments demonstrate that this hybrid storage engine significantly outperform the state-of-arts. To the best of our knowledge, this is the first LSM-tree based storage engine with FPGA accelerator.

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8. CONCLUSION

9. REFERENCES