



ACM Transactions on Storage

Special Issue on Computational Storage

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Overview

Since the first hard disk drive (HDD) was introduced in 1956, storage devices have remained “dumb” for more than 60 years. However, ever growing demand for big data processing and recent advances in storage technology are reshaping the traditional CPU-centric computing paradigm. Many studies show that the energy consumed by data movement is starting to exceed the energy consumed by computation. Especially, the advent of high-performance solid-state drives (SSDs) based on non-volatile memory (e.g., NAND flash memory, 3D XPoint, etc.) opens up new opportunities for storage-centric computing paradigm.

In response to these trends, the SNIA (Storage Networking Industry Association) has recently formed a Technical Work Group on computational storage. Computational storage is defined as any storage architecture that integrates computational features with the normal storage features in various forms to enhance performance, scalability, and energy efficiency. Samsung’s KVSSD (Key-Value SSD), a new type of SSD that offloads indexing and space management to the storage device by adopting a key-value interface, could be a first step toward computational storage.

The goal of this special issue of the ACM Transactions on Storage is to foster research and development in computational storage. This special issue welcomes contributions that showcase new storage architectures for computational storage and software ecosystems surrounding computational storage, as well as case studies with real data-intensive applications.

We invite academic researchers and industry professionals from a broad range of disciplines to submit to this special issue. Topics of interest include, but are not limited to:

- New enriched interface for computational storage
- Computational storage architecture based on Key-Value SSDs (KVSSDs) SSDs with hardware accelerators
- Computational storage architecture based on SSDs with hardware accelerators
- Host software stack for computational storage
- Application case studies with computational storage
- Performance modeling and development tools for computational storage

Submission Guidelines

Manuscripts submitted to the special issue should contain original material not published in nor submitted to other journals. Each paper will be reviewed by at least three expert reviewers. Papers which do not meet publication quality standards, or do not pass the editorial assessment of suitability of this special issue will be rejected before the review process. Full papers should be submitted through the ACM Manuscript Central at <https://mc.manuscriptcentral.com/tos>. Details of the author guidelines for ACM Transactions on Storage are available at <https://tos.acm.org/authors.cfm>.

Important Dates

Open for submissions: August 15, 2019

EXTENDED submission deadline: January 15, 2020 (deadline extended to February 7, 2020)

Review decision notification: May 15, 2020

Final manuscript deadline: June 1, 2020

Publication target date: 2020 August Issue