Introduction to the Special Section on USENIX ATC 2023

This special section of the *ACM Transactions on Storage* journal highlights work published in the 2023 USENIX Annual Technical Conference (ATC'23). While ATC is focused on systems research broadly, storage systems constitute a significant part of this community. Out of the 353 submissions to ATC'23, 80 of them (23%) were related to storage. Out of the 65 accepted papers, 13 (20%) were related to storage.

As the program co-chairs of ATC, it was our privilege to invite three of the highest-quality storage papers in ATC'23 to provide an extended version for this special section of *ACM Transactions on Storage*. The expanded versions were re-reviewed by the original reviewers of the ATC'23 submission. Here is a short summary of the articles (in no particular order).

The first article is entitled "**A contract-aware and cost-effective LSM store for cloud storage with low latency spikes,**" by Yuanhui Zhou, Jian Zhou, Kai Lu, Ling Zhan, Peng Xu, Peng Wu, Shuning Chen, Xian Liu, and Jiguang Wan, which has been expanded from the paper entitled "Calcspar: A contract-aware LSM store for cloud storage with low latency spikes," which appeared in ATC'23. The article presents a careful analysis of the performance of AWS EBS volumes, then describes an approach to address latency on LSM-tree based key value stores with fluctuation-aware caching strategies.

The second article is entitled "**Perseid: A secondary indexing mechanism for LSM-based storage systems**," by Jing Wang, Youyou Lu, Qing Wang, Yuhao Zhang, and Jiwu Shu, which has been expanded from the paper entitled "Revisiting secondary indexing in LSM-based storage systems with persistent memory," which appeared in ATC'23. The article presents an extension of LSM-trees, which aims at improving the performance of secondary indexes on persistent memory.

The third article is entitled "**Bridging software-hardware for CXL memory disaggregation in billion-scale nearest neighbor search,**" by Junhyeok Jang, Hanjin Choi, Hanyeoreum Bae, Seungjun Lee, Miryeong Kwon, and Myoungsoo Jung, which has been expanded from the paper entitled "CXL-ANNS: Software-hardware collaborative memory disaggregation and computation for billion-scale approximate nearest neighbor search," which appeared in ATC'23. The article describes how to accelerate the performance of approximate nearest-neighbor searches using CXL using relationship-aware graph caching and prefetching.

We hope you enjoy these expanded versions and find the work interesting and insightful.

Dan Williams and Julia Lawall
Program co-chairs
USENIX ATC 2023

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