Introduction to the Special Issue on USENIX FAST 2019

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This special issue of the *ACM Transactions on Storage* presents some of the highlights of the 17th USENIX Conference on File and Storage Technologies (FAST'19). Over the years, FAST has evolved into a very active community of researchers and practitioners working on a diverse and expanding set of research topics; the conference represents some of the best work being done in storage. This year was no different: FAST'19 received a record number of 145 submissions on topics ranging from non-volatile memory; distributed, cloud, and data center storage; performance and scalability; to experiences with deployed systems. Of these, we selected three high-quality articles for publication in this special issue of *ACM Transactions on Storage*.

The first article is “[INSTalytics: Cluster Filesystem Co-design for Big-data Analytics](#),” by Muthian Sivathanu, Midhul Vuppalapati, Bhargav S. Gulavani, Kaushik Rajan, Jyoti Leeka, Jayashree Mohan, and Piyus Kedia. INSTalytics is a co-designed stack of a cluster file system and the compute layer for efficient big data analytics. It customizes the three-way replication that the cluster file system employs for availability, exposing a new sliced-read API that improves the performance of joins.

The second article is “[Sketching Volume Capacities in Deduplicated Storage](#),” by Danny Harnik, Moshik Hershcovitch, Yosef Shatsky, Amir Epstein, and Ronen Kat. Obtaining the physical capacities of volumes in deduplicated storage systems is a significant challenge. This article describes sketch-based estimations of capacity needed for the management of deduplicated storage: the reclaimable capacity of a volume—the space that would be reclaimed if the volume were removed—and how much of the physical space should be attributed to each of the volumes in the system.

The final article is “[Countering Fragmentation in an Enterprise Storage System](#),” by Ram Kesavan, Matthew Curtis-Maury, Vinay Devadas, and Kesari Mishra. This work describes defragmentation techniques used in the NetApp® WAFL® file system to efficiently relocate blocks, including those in read-only snapshots.

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