FAST '11

9th USENIX Conference on File and Storage Technologies

USENIX

FEBRUARY 15–17, 2011 | SAN JOSE, CALIFORNIA

Sponsored by USENIX in cooperation with ACM SIGOPS

The 9th USENIX Conference on File and Storage Technologies (FAST '11) brings together storage system researchers and practitioners to explore new directions in the design, implementation, evaluation, and deployment of storage systems.

Back again for 2011, the FAST program is offering tutorials. Taking place on Tuesday, February 15, the four half-day tutorials give you the opportunity to learn from leaders in the storage industry. Take advantage of the special FAST offer: Buy one half-day tutorial and get the second one for free.

This year's innovative technical program includes 20 technical papers, Work-in-Progress Reports (WiPs), and two poster sessions. See the full program on the reverse side of this page.

Don't miss this opportunity to meet with premier storage system researchers and practitioners for three days of ground-breaking file and storage information and training. Register by Monday, January 31, 2011, at www.usenix.org/fast11 for the greatest savings.

Make your hotel reservation early!
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Call and mention USENIX or FAST or book online via http://www.usenix.org/fast11/hotel

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Tutorial Program

Tuesday, February 15, 2011

Half Day Tutorials (a.m.)

T1 Storage in Virtual Environments NEW!
Mostafa Khalil, *VMware*
With the growth of virtualization platforms, the demand for shared storage solutions and storage virtualization has grown significantly. This tutorial will discuss the evolution of virtualization platforms, dedicated and shared storage in virtual environments, the VMware File System (VMFS), the birth of storage virtual appliances, and the role of storage in business continuity/disaster recovery.

T2 Clustered and Parallel Storage System Technologies NEW!
Brent Welch, *Panasas*
Cluster-based parallel storage technologies are now capable of delivering performance scaling from 10s to 100s of GB/sec. This tutorial will examine current state-of-the-art high-performance file systems and the underlying technologies employed to deliver scalable performance across a range of scientific and industrial applications.

Half Day Tutorials (p.m.)

T3 Cloud Storage Systems NEW!
Benjamin Reed, *Yahoo! Research*
Prasenjit Sarkar, *IBM Research*
Cloud computing has given architects new ways of using distributed systems. At the same time, the scale and elastic nature of the cloud have caused us to rethink how we design and use these systems. This tutorial explores the storage aspect of cloud computing to show how cloud has changed the ways we look at and use storage.

T4 System Design Impacts of Storage Technology Trends NEW!
Steven R. Hetzler, *IBM Almaden Research Center*
This tutorial will introduce tools for identifying the market potential for storage technologies, which leads to an understanding of how to exploit them in the design of storage systems. We will examine the economic foundations of storage technologies, including an analysis of the capital costs required to produce storage. The primary focus will be on solid state storage in IT systems, but broader application will be shown as well.

Conference Organizers

Program Co-Chairs
Greg Ganger, *Carnegie Mellon University*
John Wilkes, *Google*

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Technical Sessions

Wednesday, February 16, 2011

9:00 a.m.–10:30 a.m. Wednesday

OPENING REMARKS AND BEST PAPER AWARDS

Program Co-Chairs: Greg Ganger, *Carnegie Mellon University;* John Wilkes, *Google*

DEDUPLICATION

Session Chair: Cristian Ungureanu, *NEC Labs*

A Study of Practical Deduplication
Dutch T. Meyer, *Microsoft Research and the University of British Columbia;* William J. Bolosky, *Microsoft Research*

Tradeoffs in Scalable Data Routing for Deduplication Clusters
Wei Dong, *Princeton University;* Fred Douglis, *EMC;* Kai Li, *Princeton University and EMC;* Hugo Patterson, Sazzala Reddy, and Philip Shilane, *EMC*

11:00 a.m.–12:30 p.m. Wednesday

SPECIALIZING STORAGE

Session Chair: Michael A. Kozuch, *Intel Labs Pittsburgh*

Capo: Recapitulating Storage for Virtual Desktops
Mohammad Shamma, Dutch T. Meyer, Jake Wires, Maria Ivanova, Norman C. Hutchinson, and Andrew Warfield, *University of British Columbia*

Exploiting Half-Wits: Smarter Storage for Low-Power Devices
Mastooreh Salajegheh, *University of Massachusetts Amherst;* Yue Wang, *Texas A&M University;* Kevin Fu, *University of Massachusetts Amherst;* Anxiao (Andrew) Jiang, *Texas A&M University;* Erik Learned-Miller, *University of Massachusetts Amherst*

Consistent and Durable Data Structures for Non-Volatile Byte-Addressable Memory
Shivaram Venkataraman, *HP Labs, Palo Alto, and University of Illinois at Urbana-Champaign;* Niraj Tolia, *Maginatics;* Parthasarathy Ranganathan, *HP Labs, Palo Alto;* Roy H. Campbell, *University of Illinois at Urbana-Champaign*

12:30 p.m.–2:00 p.m. Conference Luncheon

2:00 p.m.–3:30 p.m. Wednesday

FLASH

Session Chair: Christos Karamanolis, *VMware*

CAFTL: A Content-Aware Flash Translation Layer Enhancing the Lifespan of Flash Memory based Solid State Drives
Feng Chen, Tian Luo, and Xiaodong Zhang, *The Ohio State University*

Leveraging Value Locality in Optimizing NAND Flash-based SSDs
Aayush Gupta, Raghav Pisolkar, Bhuvan Urgaonkar, and Anand Sivasubramaniam, *The Pennsylvania State University*

Reliably Erasing Data from Flash-Based Solid State Drives
Michael Wei, Laura Grupp, Frederick E. Spada, and Steven Swanson, *University of California, San Diego*

4:00 p.m.–5:30 p.m. Wednesday

THE DISK AIN'T DEAD

Session Chair: Benjamin Reed, *Yahoo! Research*

A Scheduling Framework That Makes Any Disk Schedulers Non-Work-Conserving Solely Based on Request Characteristics
Yuehai Xu and Song Jiang, *Wayne State University*

Improving Throughput for Small Disk Requests with Proximal I/O
Jiri Schindler, Sandip Shete, and Keith A. Smith, *NetApp,Inc.*

FastScale: Accelerate RAID Scaling by Minimizing Data Migration
Weimin Zheng and Guangyan Zhang, *Tsinghua University*

5:45 p.m.–7:45+ p.m. Wednesday

POSTER SESSION & RECEPTION

The poster session will allow researchers to present recent and ongoing projects and will include posters for today's papers. Enjoy dinner and drinks while chatting with poster presenters and mingling with other attendees, speakers, and conference organizers. See http://www.usenix.org/fast11/posters for more info. Proposals are due by 3:00 p.m. PST on January 24, 2011.

Thursday, February 17, 2011

9:00 a.m.–10:30 a.m. Thursday

SCALING WELL

Session Chair: Steve Hand, *University of Cambridge*

The SCADS Director: Scaling a Distributed Storage System Under Stringent Performance Requirements
Beth Trushkowsky, Peter Bodík, Armando Fox, Michael J. Franklin, Michael I. Jordan, and David A. Patterson, *University of California, Berkeley*

Scale and Concurrency of GIGA+: File System Directories with Millions of Files
Swapnil Patil and Garth Gibson, *Carnegie Mellon University*

AONT-RS: Blending Security and Performance in Dispersed Storage Systems
Jason K. Resch, *Cleversafe, Inc.;* James S. Plank, *University of Tennessee*

11:00 a.m.–12:30 p.m. Thursday

MAKING THINGS RIGHT

Session Chair: John Bent, *Los Alamos National Lab*

Emulating Goliath Storage Systems with David
Nitin Agrawal, *NEC Laboratories America;* Leo Arulraj, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau, *University of Wisconsin—Madison*

Just-in-Time Analytics on Large File Systems
H. Howie Huang, Nan Zhang, and Wei Wang, *George Washington University;* Gautam Das, *University of Texas at Arlington;* Alexander S. Szalay, *Johns Hopkins University*

Making the Common Case the Only Case with Anticipatory Memory Allocation
Swaminathan Sundararaman, Yupu Zhang, Sriram Subramanian, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau, *University of Wisconsin—Madison*

12:30 p.m.–2:00 p.m. Lunch (on your own)

2:00 p.m.–3:30 p.m. Thursday

WORK-IN-PROGRESS REPORTS (WIPS)

The FAST technical sessions will include a session for Work-in-Progress reports, preliminary results, and "outrageous" opinion statements. See http://www.usenix.org/fast11/wips for more info. Proposals are due by 3:00 p.m. PST on January 24, 2011.

4:00 p.m.–5:30 p.m. Thursday

FLASH THE SECOND

Session Chair: Hakim Weatherspoon, *Cornell University*

Exploiting Memory Device Wear-Out Dynamics to Improve NAND Flash Memory System Performance
Yangyang Pan, Guiqiang Dong, and Tong Zhang, *Rensselaer Polytechnic Institute, USA*

FAST: Quick Application Launch on Solid-State Drives
Yongsoo Joo, *Ewha Womans University;* Junhee Ryu, *Seoul National University;* Sangsoo Park, *Ewha Womans University;* Kang G. Shin, *Ewha Womans University and University of Michigan*

Cost Effective Storage using Extent Based Dynamic Tiering
Jorge Guerra, *Florida International University;* Himabindu Pucha, Joseph Glider, and Wendy Belluomini, *IBM Research Almaden;* Raju Rangaswami, *Florida International University*

5:45 p.m.–7:45+ p.m. Thursday

POSTER SESSION & RECEPTION

Join us for a second evening of dinner, drinks, and the opportunity to learn about new or ongoing work. This second poster session will have different posters from last night's session and will include posters for the Thursday papers and WiPs, providing an opportunity for follow-up with speakers. See http://www.usenix.org/fast11/posters for more info. Proposals are due by 3:00 p.m. PST on January 24, 2011.