TEST-101B-1: The Performance Story: An Independent Evaluation of Flash Storage (Testing Track)
Tue 9:45-10:50

Chairperson: Kimball Brown, BlackRidge Technology

Session Presentations

8:30 AM, 60 min presentation and Q&A

- Dennis Martin, President, Demartek
    - The Performance Story: An Independent Evaluation of Flash Storage

Improved Drive Qualification Methods for Enterprise SSDs

- Dennis Martin, President, Demartek
    - Author Bio: Dennis Martin is the founder and President of Demartek, an analyst firm focused on validation and performance testing of data center products. Demartek has its own fully equipped, modern test lab with the servers, networking and storage gear found in today's data centers. Its widely recognized reports cover products and technologies from both well-known vendors and startups, including Broadcom, Cavium, Cisco, Dell EMC, HPE, IBM, Intel, Microsemi, NetApp, Nimbus Data, Pure Storage, Samsung, Seagate, Toshiba, Western Digital and others. Demartek also produces popular industry references, including its "Storage Interface Comparison" covering every interface used by storage systems and its "SSD Deployment Guide" that explains everything you need to know to deploy flash-based storage systems in the datacenter. Dennis' commentary "NVMe over Fabrics Rules of Thumb" is a must-read for those designing storage systems that will take advantage of NVMe devices with multiple network adapters for network fabrics. Dennis is frequently quoted in the press (in such outlets as TechTarget, Market Watch, and Street Insider) on such topics as best practices for deploying SSD technologies and analyzing performance claims for all-flash arrays. A 38-year veteran of the technology industry, Dennis was previously a Senior Analyst with Evaluator Group and a marketing and engineering executive with StorageTek. He has been a Microsoft storage MVP since 2005.

TEST-201-1: Testing/Performance Analysis (Testing Track) Wed 8:30-10:50

Organizer: Joseph Chen, VP Engineering, ULINK Technology

Co-Organizer + Co-Chair: Easen Ho, President, S3 Metrics

Session Presentations

8:30 AM, 20 min each presentation + 5 min Q&A
- Jeffrey Fritzjunker, IBM
  - Improved Drive Qualification Methods for Enterprise SSDs
- Eden Kim, Calypso Systems
  - How Will Your Enterprise SSD Handle Real Workloads?
- Theodore Antonakopoulos, University of Patras
  - An Advanced Flash Emulator for Designing Today's High-Capacity Controllers

9:50 AM, 20 min each presentation + 5 min Q&A
- Haocheng Huang, Starblaze
  - Design Register Accurate SSD Software Simulator
- Linden Hsu, Advantest
  - Diagnosing SSD Failures During Testing

Improved Drive Qualification Methods for Enterprise SSDs

- Jeffrey Fritzjunker, IBM
    - Paper Author: Jeffrey Fritzjunker, Manager, Supply Chain Engineering, Storage Device Qualification, IBM
    - Author Bio: Jeff Fritzjunker is a Senior Engineering Manager at IBM focused on qualification of storage devices. He has been a leader in IBM test engineering for many years, and has led worldwide teams on qualifying enterprise HDDs and SDDs. He also led test engineering for POWER systems servers and for several IBM supercomputers. He has published articles in the IBM Journal of Research and Development and given presentations at previous Flash Memory Summits. A 30-year veteran of IBM, he earned an MSEE from the University of Minnesota and a BS in computer engineering from Iowa State University.

How Will Your Enterprise SSD Handle Real Workloads?

- Eden Kim, Calypso Systems
  - Author Bio: Eden Kim is CEO of Calypso Systems, a leading SSD test vendor. He has been the unquestioned leader in developing test specifications for SNIA and has lectured on the subject around the world. He is chair of the SNIA SSS Technical Working Group and the SSSI Technical Development Committee. Eden has published several papers on SSD performance testing and SSD product architectures. He has presented frequently at past Flash Memory Summits, at SNIA's Storage Developer Conference, StorageVisions, and many other events. He has also published whitepapers on SSD workloads.

An Advanced Flash Emulator for Designing Today's High-Capacity Controllers

- Theodore Antonakopoulos, University of Patras
  - Paper Author: Theodore Antonakopoulos, Professor, University of Patras
  - Author Bio: Theodore Antonakopoulos is a Professor in the Electrical and Computers Engineering Department of the University of Patras (Greece). He leads the Cognitive Computing Machines and Embedded Systems (COMES) group at the university with research focusing on storage systems, in-memory computing, and hardware accelerators. He holds 10 patents in memory and storage technology, mostly related to work done in conjunction with IBM researchers, with two more in process. He spent a sabbatical year at IBM Research Laboratory in Zurich, Switzerland, where he worked on hardware development for storage devices. He has also published many papers and given or contributed to many conference presentations (including ones at the UCSD Non-Volatile Memory Workshop) on memory-related subjects with special emphasis on phase-change memory, PCIe-based storage, and emulators. He earned his PhD in electrical engineering at the University of Patras (Greece).

Design Register Accurate SSD Software Simulator

- Haocheng Huang, Starblaze
  - Paper Author: Bruce Cheng, Senior Staff Engineer, Starblaze Technology
  - Author Bio: Bruce Cheng is an SSD architect at Starblaze Technology, where he is responsible for defining the SSD ASIC architecture, and for researching and evaluating new storage technology He has good experience on both ASIC design and SSD firmware design. Before joining Starblaze, he was a Staff Engineer at VeriSilicon, where he did design and verification for ARM-based SoC systems and implemented high-performance hard blocks such as ARM Cortex-A7/A9 processors. He earned a Master's degree in Electronic Engineering at the University of Electronic Science and Technology of China.

Diagnosing SSD Failures During Testing

- Linden Hsu, Advantest
  - Paper Author: Linden Hsu, R&D Engineer Expert, Advantest
  - Author Bio: Linden is an R&D Engineer Expert in Advantest's System Level Test business unit. He is the FPGA lead for the PCI Express protocol and the lead for Traffic Capture and Debug Tools which help isolate the root cause of device failures on a multi-protocol SSD production tester. Before joining Advantest, he was the programmable logic design lead for LeCroy (later Teledyne LeCroy)'s Receiver Test Group. He has over 10 years experience in developing test equipment and over 25 years in the technology industry. Linden earned a BSEE from UCLA.

TEST-301A-1: Testing Issues (Testing Track)
Thu 8:30-9:35

Chairperson: Marilyn Kushnick, R & D Engineer, Advantest

Session Presentations

8:30 AM, 20 min each presentation and Q&A

- Sneha Nadig, Advantest
  - Testing Dual-Port NVMe SSDs
- Saugata Ghose, Carnegie-Mellon University
  - Enabling Realistic Simulations of the Latest Multi-Queue SSDs
- Shing Lee, R&D Senior Manager, ADATA Technology
  - Open Source Software for Managing Performance Analysis of Flash Storage

Testing Dual-Port NVMe SSDs

- Sneha Nadig, Advantest
  - Author Bio: Sneha Nadig is Product Applications Engineer at Advantest, where she is in charge of product engineering for a multi-protocol system to test multi-lane high performance SSDs. She has developed customized application test programs and implemented vendor-unique commands for testing NVMe, SATA, and SAS SSDs. She holds an MS in Engineering Management from Santa Clara University, an MSEE from ESIEE Paris, France, and a Bachelor of Engineering in Electronics and Communication from Gujarat University, India.

Enabling Realistic Simulations of the Latest Multi-Queue SSDs

- Saugata Ghose, Carnegie-Mellon University
    - Author Bio: Saugata Ghose is a Systems Scientist in the Department of Electrical and Computer Engineering at Carnegie Mellon University. His current research interests include application- and system-aware memory and storage systems, flash reliability, architectural solutions for large-scale systems, GPUs, and emerging memory technologies. He has published thirty technical articles in highly-selective venues, written four book chapters on flash reliability and memory, and given presentations at previous Flash Memory Summits and other events. He serves as Flash Memory Summit's Academic Coordinator. He earned his MS and PhD in computer engineering from Cornell University, and dual BS degrees from the State University of New York Binghamton.

Open Source Software for Managing Performance Analysis of Flash Storage

- Shing Lee, ADATA Technology
    - Author Bio: Shing Lee is Director of the software department at ADATA Technology. He represents the company at JEDEC where he contributes to new industrial storage and memory standards such as NGSFF and NVDIMM. Shing leads multiple engineering teams to deliver firmware for all ADATA SSD product lines. He has helped ADATA double its SSD market share since 2013. Shing has over 20 years of software development experience in the memory storage, datacom, and telecom industries. Before joining ADATA, he held management position in embedded systems at both Intel and Motorola. He currently holds two patents and has ones pending in wireless communication for AI robotics applications. He earned an MS in computer science and engineering from the University of Texas and a BS in computer engineering from the National Chiao-Tung University (Taiwan).