Chairperson’s Message

Flash Memory Summit 2016 offers many new features to help you meet the coming year’s challenges. A track of invited speakers will present the industry’s top technical minds; a marketing track will help you find customers and meet their needs; media and entertainment sessions will introduce emerging applications, including virtual reality.

First-time Keynote speakers—including Mangstor, Crossbar, and Huawei—will join returnees such as EMC, Facebook, Marvell, Microsemi (formerly PMC-Sierra), Micron, Nimbus Data, Samsung, SanDisk (now part of Western Digital), Seagate, SK Hynix, and Toshiba. We’ve also added many sessions on the rapidly emerging NVMe SSDs.

Returning FMS activities include:
- Sessions on 3D NAND, persistent memory, and enterprise applications (case studies);
- Extensive coverage of flash controllers;
- Panels covering market research, future trends, venture capital, and life beyond flash;
- The ever-popular beer and pizza session where you can talk shop with leading experts in an informal setting.

We’ll also have an even bigger and better exhibit area with a product teardown stage and more demonstrations. Please join us in August for the best FMS ever!

Tom Coughlin
Coughlin Associates
Can Flash Memory Resolve Your Application Bottlenecks? Find out why all-flash arrays are appearing in data centers everywhere! Flash Memory Summit will show you how your competitors are using flash arrays to speed up databases, real-time business analysis, virtual reality, and cloud computing!

"Swapping all of your hard drives for SSDs makes financial sense." HPE

This Year’s Big News
• NVMe is everywhere and FMS has 40+ presentations on it
• 3D NAND is taking over flash storage
• 3D XPoint™ promises storage at memory speeds
• All-flash data center is here now!

Solutions You Can Use Today
• Speed up systems with PCIe and NVMe SSDs
• Develop fast, low-cost controllers
• Use flash in cloud interfaces and cloud storage
• Maximize system speed with flash on the memory bus
• Accelerate popular applications with flash
Flash Memory Summit continues to be the largest solid state storage industry show with high-level keynoters, the largest exhibit hall, and the most sessions covering everything from applications and architectures through enterprise storage, non-volatile memory, and new technologies. FMS covers the latest and greatest, including 3-D flash, wearables, media and entertainment applications, flash on the memory bus, PCIe/NVMe SSDs, and the all flash data center. As one attendee put it, “Flash is a big community and FMS is the right show.” If you are involved in the digital storage industry, you won’t want to miss Flash Memory Summit 2016, this summer’s hot technology event!

2016 Flash Storage/NVMe Innovation Leader Awards
as voted by IT Pros
Wednesday 2:10 pm
Thirteen product categories, Special Achievement Award and the 2016 Most Innovative New NVM Product.
www.itbrandpulse.com/brand-leader/

Best of Show Awards
Wednesday 6:00 pm
Best of Show Awards represent a great opportunity for industry recognition of your company’s products and solutions. Don’t miss this chance to have your company’s name up in lights! Entry forms, deadlines and contest rules are available online.

Get the latest product scoop at FMS Theatre!
Open during Exhibit Hall hours
The FMS Theatre is where leading vendors will give you the latest information on their products. Hear about chips, components, subsystems, and enterprise storage, plus everything in-between, as well as software and test equipment. Giveaways and prizes are always in fashion, and theatrical props are encouraged. For details, contact kat@flashmemorysummit.com.

Reasons to Attend This Year’s Summit
LATEST TRENDS  Hear about 3-D flash, flash on the memory bus, persistent memory, and high-performance flash systems. Find out about applications in automobiles, wearables, Internet-of-Things, media and entertainment, and hyperconvergence.
BEST SOURCE  Flash Memory Summit is the only event of its kind. It’s the place to learn everything you need to know about SSDs and flash memory. Nothing else comes close!
NETWORKING  Talk with key product suppliers; hear from others with similar questions and issues; and take advantage of the Beer, Pizza, and Chat with the Experts Session for one-on-one discussions.
EXHIBITS  Meet hardware and software developers, policy makers, component manufacturers, marketers, and venture capitalists, representing companies large and small.

Solutions Showcase
Open during Exhibit Hall hours
This year’s FMS Solutions Showcase will highlight the hottest technologies displayed and demonstrated in real-world applications by leading flash and storage vendors. It’s a must see on the exhibit floor. For details, contact kat@flashmemorysummit.com.

Exhibit Hall
New for 2016, the Exhibit Hall is open Tuesday from 4 to 7pm, Wednesday from noon to 7pm, and Thursday from 10am to 2pm.

Exhibit Hall Opening Reception
Tuesday 4:00 - 7:00 pm
In addition to Wednesday’s All Industry Reception.

Exhibiting / Sponsorship
Interested in sponsoring and/or exhibiting at FMS 2016? Contact alan@FlashMemorySummit.com.

August 9-11, 2016 • Santa Clara Convention Center
Sponsors

Premier Sponsors


Platinum Sponsors


Emerald Sponsors


Gold Sponsors


Bronze Sponsors


Organizational Sponsors


Keynote Presentations

Keynote 1: Facebook
How We Use Flash at Facebook: Tiered Solid State Storage
Tuesday 11:00 - 11:30 am
Vijay Rao, Director Technology/Strategy, Facebook

Keynote 2: Micron
Turning Big Data into Critical Business Advantage with Flash Memory
Tuesday 11:30 am - Noon
Darren Thomas, VP/GM Storage Business Unit, Micron

Keynote 3: Toshiba
New 3D Flash Technologies Offer Both Low Cost and Low Power Solutions
Tuesday Noon - 12:30 pm
Jeff Ohshima, Technology Executive, Storage and Devices Solutions Company, Toshiba, and Yoichiro Tanaka, Sr. Fellow, Toshiba Storage and Electronic Devices Company

Keynote 4: SanDisk
Tuesday 1:40 - 2:10 pm
Siva Sivaram, Executive VP Memory Technology, SanDisk

Keynote 5: Huawei
Using Storage Class Memory to Create Scalable Cognitive Computers
Tuesday, 2:10 - 2:40 pm
Balint Fleisher, Chief Research Officer, Huawei

Keynote 6: Marvell
Tuesday 2:40 - 3:10 pm
Zining Wu, CTO, Marvell

Keynote 7: SK Hynix
Technology Innovation for Future Storage Systems/ NAND Satisfies Both Performance-Based and Cost-Sensitive Enterprise Applications
Wednesday 11:00 - 11:30 am
Kyo Won Jin, Sr. Vice President, Head of NAND, SK Hynix

Keynote 8: Samsung
3D NAND is the Leadership Technology for Server Storage
Wednesday 11:35 am - 12:05 pm
Jim Elliott, Corporate VP Memory Marketing, Samsung, and Jaeheon Jeong, Executive VP R&D, Samsung

Keynote 9: Microsemi
The NVMe Inflection Point
Wednesday 2:10 – 2:40 pm
Derek Dicker, VP/Business Unit Manager Performance Storage, Microsemi

Keynote 10: Seagate
Design Efficient Storage Systems with Both Flash and HDDs
Wednesday, 2:40 - 3:10 pm
Phil Brace, President Cloud Systems and Silicon Group, Seagate

Keynote 11: EMC
Wednesday 3:10 - 3:40 pm
Danny Cobb, EMC Fellow/VP New Media Strategy, EMC

Keynote 12: Nimbus Data
Scaling Flash Storage Efficiently in the Exabyte Era
Thursday 11:00 - 11:30 am
Tom Isakovich, CEO, Nimbus Data

Keynote 13: Crossbar
RRAM—Your Key to Creating Faster, More Scalable Storage
Thursday 11:30 am - Noon
George Minassian, Founder/CEO, Crossbar

Keynote 14: Mangstor
NVMe over Fabrics Offers Top Performance for Real Time Analytics
Thursday Noon - 12:30 pm
Paul Prince, CTO, Mangstor
Forums and Sessions  Partial list • for more information visit www.FlashMemorySummit.com

APPLICATIONS TRACK

Session 101-A: Mobile Applications
• Transfer 5 Gigs of Data in a Flash
• PCIe NVMe SSD in Smaller Form Factors
• The Next UFS Disruptions in Mobile

Session 301-I: Consumer Applications
• Flash and SmartPhones: Advanced Lab Data Recovery from Secure Mobile Device
• 3-D NAND and UFS Deliver Optimized Mobile Storage Solutions
• Consumer PCIe SSD

Session 303-H: Automotive Applications
• Reliable Solid State Storage for IoT/Automotive
• Memory Requirements for Self Driving Cars
• MRAM in Automotive Applications
• Driver Assistance Pushes New Flash Functionalities

Session 304-B: Accelerating In-Memory Applications with Flash

ARCHITECTURES TRACK

Forum B-11: Flash-Memory Based Architectures—A Technical Discussion, Part 1
• Next-Generation Storage Architectures for Diversified Data-Centric Applications
• An SSD Architecture That Combines Security and Performance
• Machine Learning Techniques for Improving Flash Endurance
• New Approaches to Keeping Write Amplification from Reducing Flash Lifetime

Forum B-12: Flash Memory Based Architectures—A Technical Discussion, Part 2
• Storage Controller Technologies for Next Generation Non-Volatile Memories
• Employing ECCs via Overprovisioning to Improve Flash Reliability—A New, Cost Efficient Approach
• Open-Channel SSDs and Host-Based Flash Translation Layers
• How NVMe and 3D XPoint™ Will Create a New Data Center Architecture

BUSINESS/MARKETING TRACK

Forum N-11: Flash Growth and Opportunity in China
• All Flash Micro NAS Project at HDU
• NVMe SSD Application in China’s Hyperscale Datacenter
• Flash Applications Practice and Prospects in Chinese Enterprises
• Exploiting the Minipage-level Mapping to Solve the Size Discrepancy of I/O Requests and Flash Pages
• Logic Based ReRAM Assisted by Self-Adaptive Circuit for Embedded Applications
• Reduce Write Amplification for All-Flash Arrays

Session 101-C: Stalking the Elusive Enterprise Flash Customer

Session 302-I: Secrets of the Flash Marketing Masters

Session 303-A: Flash Storage from the Other Side—TechTarget Editors Report What Users Think

Session 303-G: Market Research
• Flash and Global Market Changes

CONTROLLERS TRACK

Forum E-21: Controllers and Flash Technology Part 1—Hardware and Algorithms
• Controller IC Evaluation of High Radix Parity Check Code
• Area Efficient LDPC Decoder for NAND
• High-Throughput LDPC Solution for Reliable and High Performance SSD
• Ultra High Throughput ECC for SSD
• Compression: Making Flash (Even) Cheaper
• Advanced Controller Technology for 3D NAND Flash

Forum E-22: Controllers and Flash Technology, Part 2—Error Correcting Codes
• Practical Threshold Voltage Distribution Modeling
• Media Management for High Density NAND Flash Memories
• Optimized LDPC Error Correction For Flash
• NANDMac: Machine Learning for Multi Code Rate LDPC
• Spatially Coupled Coding and Non-Binary LDPC for Flash

Forum E-31: Flash Controller Design Options
• Low-Error Floor Soft-Decision Finite Alphabet Iterative Decoders
• Flexible Controller Code Rate
• High-Speed LDPC ECC with 5000x Read Cycle Extension for Enterprise SSDs
• Ultra High Throughput ECC for SSD
• False Decoding Probability (a.k.a. Detection) of BCH and LDPC Codes
• On Overcoming the Effects of Stopping Sets in Error Correction Codes
• Reliability Tradeoffs For Flash-Based Error Correction

Session U-3: Annual Update on Flash Controllers

DATA CENTERS TRACK

Forum D-11: Flash in Data Centers
• NVMe, Storage Class Memory and Operational Databases: Real-World Results
• Driving Down Storage Costs for High-Performance Databases
• Intent-Defined Storage for the Container Era
• Why NVMe Will Replace SATA SSDs in the Data Center
• The Winning Combination is FC-NVMe

Session 301-H: Is It Time For The All-Flash Data Center?


continued
Forums and Sessions  continued

DATA MANAGEMENT TRACK
Forum Q-21: Flash in Big Data and Analytics
• NVMe-propelled Active SSD Acceleration for Big Data Processing
• Frog Storage: Towards Unified Storage for Large Scale Analytics
• Big Data and the Role of 3D NAND Flash in the All-Flash Array
• Unified Memory for HPC and Big Data
• Accelerating Business Analytics with Flash Storage and an FPGA
• Reducing Big Data Analytics Power Consumption with Emerging Storage Technologies

Session 102-A: Data Recovery of SSDs
• Advanced Data Recovery Techniques for Enterprise SSD
• SSD Impact on Data Recovery for Enterprise Storage
• Data Erasure on Solid State Storage: Defining the Needs, Functionalities, and Challenges
• If It's So Easy to Erase a Whole SSD, Why Is It So Hard to Wipe One File?

Session 303-B: Flash in Big Data Applications
• Data Appliances Converge on the Memory Hot Zone
• Where to Use Silicon to Accelerate Big Data Workloads
• Predictive Analysis Drives Future of Enterprise Flash
• Is the World Ready for Big Data Flash?

EMBEDDED SYSTEMS TRACK
Session 203-B: Embedded Applications, Part 1
• Innovative Combination NAND Flash Solution Prevention, Reporting, Analysis
• Case for Industrial Embedded Flash Storage
• How Data Analysis Benefits Embedded Applications
• Lifetime Estimation and Health Monitoring

Session 204-B: Embedded Applications, Part 2
• How to Ruggedize an SSD
• Memory Needs for Industrial Applications
• Can Embedded Applications Utilize the Latest Flash Storage Technologies?

ENTERPRISE APPLICATIONS TRACK
Forum G-11: Enterprise Applications Part 1
• Extreme Performance and the Cloud ... A SaaS Provider’s Journey
• Data Direct Networks Customer Case Study
• Dell Customer Case Study 1
• Dell Customer Case Study 2
• HDS Customer Case Study
• FICO: We Guarantee Performance for High-Performance, SLA-Demanding Workloads

Forum G-12: Enterprise Applications, Part 2
• The Future of Enterprise Storage
• Flash Storage Drives a Better Bottom Line
• Customer Case Study 1
• Customer Case Study 2
• Increase Tier 1 Application Performance, Availability, and Flexibility While Reducing Cost

Forum G-21: Enterprise Applications, Part 3
• Lewis Global Case Study
• Delivering Memory Performance with Shared Flash
• Samsung Electronics America Customer Case Study

Session 201-D: Why Flash Should Be Used For Every Workload
Session 202-D: The Best Way to Solve Killer Performance Problems
Session 204-D: Selecting the Right Flash Memory For Your Application
Session 302-C: How Flash Will Transform Enterprise Applications

ENTERPRISE STORAGE TRACK
Forum D-12: Enterprise Storage Design, Part 1
• Picking the Right Infrastructure Model
• All-Flash Data Center Use Cases
• Making All Flash Data Centers a Reality
• Using SSDs Efficiently within a Scale-Out Software-Defined Storage Framework

Forum D-21: Enterprise Storage Design, Part 2
• Extend the Life of Your SAN with Flash
• All Flash Storage Sparing to Improve Endurance
• A Solid State Storage Solution Driven by an Arria® 10 FPGA with Embedded ARM® Cortex®A9
• Stream-Optimized Data Reduction for Enterprise Flash Storage
• Maximizing Leading Edge Flash for Systems
• Guaranteeing Enterprise Class Availability in a Flash Environment

Session U-2: Annual Update on Enterprise Flash Storage
Session 201-C: Flash Arrays, Part 1
• Achieving High Availability of Software-Defined All-Flash Arrays with a Shared Nothing Architecture
• ICT Infrastructure Employing NV-Array
• Powerful Management Tools Get the Most out of All-Flash Arrays

Session 202-C: Flash Arrays, Part 2
• Improving All Flash Array Performance with Data Compression Accelerators
• Defining Requirements for a Successful All-Flash Datacenter

Session 303-C: Major Enterprise Flash Customers Tell It Like It is

FLASH TECHNOLOGY TRACK
Session U-1: Annual Update on Flash Technology
Session 302-E: CTO Panel
Session 302-H: Flash Technology Futures

GENERAL TRACK
Session 204-C: Women in the Storage Industry
Session 303-I: VC Forum
Session 304-B: Top Ten Things You Need to Know about Flash Memory Today

HARDWARE TRACK
Session 301-G: High Performance Flash Systems
• Software-Defined Memory for AI-scale and High-Performance Computing

HISTORY TRACK
Session 302-B: History Session—The Origins of Silicon Valley

continued
Forums and Sessions  continued

INVITED TALKS TRACK
Session IT-1: Accelerating Flash Storage with Open Source RDMA
Session IT-2: Flash Memory—Key to Efficient Real-Time Analysis of Big Data
Session IT-3: Making New Storage-Class Memory Technologies Easier to Adopt
Session IT-4: FPGAs/GPUs in Flash Controller Applications
Session IT-5: Future Memories and Today’s Opportunities
Session IT-6: The Business of NAND—Trends, Forecast, and Challenges
Session IT-7: Opportunities from Our Compute, Network, and Storage Inflection Points
Session IT-8: Storage in Media and Entertainment: The Flash Advantage
Session IT-9: TechTarget Reveals All ... About the Enterprise All-Flash Array Market
Session IT-10: Embedded NVM—Automotive and IoT Are Driving the Industry

MEDIA/ENTERTAINMENT TRACK
Session 101-B: Flash Memory Meets Film’s Rising Capture/Content Requirements
• IP/Storage in the Entertainment Industry
• Flash Memory Meets Film’s Rising Capture/Content Requirements
Session 102-B: Flash Demand Grows with HDR/UHD 4K Films
• SSD Shared Storage for 4K Post-Production
• Flash Demand Grows With HDR/UHD 4K Films
• 360 Footage and Flash Memory
• Managing Storage for Performance, Redundancy, and Expansion
Session 103-B: Flash Storage and Film Production in the Cloud
• Focusing on Workflow Performance, Not Storage
• Putting Performance Where It Counts
• Speed to the Cloud. In the Cloud
Session 104-B: Film Storage When the Film Budget Is Yours
• Heating up the Old Workflow Systems
• Disasters—Blow by Blow
• When Content Flies
• Keeping Content out of Harm’s Way

NEW TECHNOLOGIES TRACK
Forum M-22: 3-D Flash
• NAND Satisfies Both Performance-Based and Cost-Sensitive Enterprise Applications
• SSD Flash Management for 3D NAND Flash Memory
• The Frontier for 3D NAND Flash Technology
• 3D NAND Assessment for Next Generation Flash Applications
• 3-D NAND SSDs Meet Low-Latency Requirements
• Overcoming Challenges in 3D NAND Volume Manufacturing
Forum R-21: Persistent Memory—Beyond Flash
sponsored by SNIA SSI, the SNIA Solid State Storage Initiative
• Building Datacenter Infrastructure Using Persistent Memory
• Networking New Persistent Memory Technologies
• New Software Architectures for Persistent Memory
• Enabling Persistent Memory: The NVM Programming Model
• Storage Class Memory in Windows
• Opportunities and Challenges Arising from Bringing NVMe Technology into SAP HANA In-Memory Platform
Session U-4: Annual Update on Emerging Memory Technologies
Session 201-A: Applying New Non-Volatile Memory Technologies
• Novel Recognition System using XP-ReRAM
• Performance Requires Endurance
Session 202-A: Flash on the Memory Bus
• New NVM-X Solution with 25.6gB/s Bandwidth
• Optimizing Applications By Using Flash As System Memory
• Unified Memory Interface for Hybrid DRAM/3D-XPoint or NAND Devices
Session 203-A: RRAM
• Advanced Prototyping Service for Non-Volatile Memory Technologies: Latest Results and Future Trends
Session 204-A: MRAM
• Introduction to Spin Transfer Torque RAM
Session 301-A: Life Beyond Flash—New Non-Volatile Memory Technologies
• Status and Forecast for New NVM technologies
• NRAM: High Performance, Highly Reliable Emerging Memory
• Challenges in Vertically Stackable Selectors for 3D Cross-Point Non-Volatile Memories
Session 301-B: NVDIMM
Session 301-C: Intel-Micron 3D XPoint™
Session 302-A: Persistent Memory Applications
• High-Speed I/O Processors Meet the Demands of Storage Class Memory
• Application-Dependent SCM/NAND Flash Hybrid Solid-State Drive Design
• Application Use Cases for Flash as Memory
Session 304-A: Flash and the Internet of Things
• Embedded Flash Storage for Industrial IoT
• MRAM Usage in IoT Applications
• Prescriptive Transactional Analytics for NVM Performance Testing
• FE Ts Produce Scalable Memories for IoT Applications

PCIe STORAGE TRACK
Forum A-11: NVMe and PCIe SSDs, Part 1
• NVMe Workgroup Report: Updates, Trends, Directions, and Plans
• NVMe over Fabrics Panel—Which Transport Is Best?
Forum A-12: NVMe and PCIe SSDs, Part 2
• NVMe Drivers—Current Status and Future Expectations
• Lessons Learned Deploying NVMe in Real Systems
Forum A-22: PCIe/NVMe Storage
• PCI Express: Driving the Future of Storage
• Advantages of PCI Express 4.0 Interface for SSDs
• Secure Boot for NVMe SSD
• Disruptive NVMe Architecture Based on an FPGA Achieves over 1M IOPS
• NVMe on OpenSSD
• FPGA Implementation of Erasure Codes for NVMe based JBOFs
Session 301-D: PCIe/NVMe Development Issues
• Concurrent Support of NVMe Over RDMA Fabrics and Established Networked Block and File Storage
• NVMe Enclosure Management and Dual Port Drive
• NVMe Direct Attach Storage Solution for Any Server
• New Data Protection Systems for NVMe SSD
Session 302-D: PCIe/NVMe Extensions, Part 1
• NVMe: Redefining the Hardware/Software Architecture
• High Performance FTL Architecture for PCIe/NVMe SSDs
• Prioritization in the NVMe Block Layer

continued
Forums and Sessions  continued

**PCle STORAGE TRACK Continued**

**Session 302-G: Which Interface Is King of the Hill? Should You Build Your All-Flash Array with SAS, SATA, or NVMe?**

sponsored by STA, the SCSI Trade Association

**Session 303-D: PCle/NVMe Extensions, Part 2**

• High Availability for Centralized NVMe
• Flash Array Performance to the PCle Slot
• PCle NVMe Client SSD with 3D TLC
• Unshackling PCle SSDs Using NVMe

**Session 304-D: PCle/NVMe Fabrics**

• NVMe over Fabrics - High Performance Flash Moves to Ethernet
• Leveraging the Benefits of Flash Memory with NVMe over Fabrics
• Reducing Latency and Improving Performance Consistency in NVMeOF

**SECURITY TRACK**

**Session 103-A: Security in a Flash!**

• Security Beyond Self Encrypted Devices
• Every Product is a Security Product
• Self-Encrypting Storage: Simplest Security for Stored Data
• Industrial Copy Protection by Secure Storage-Devices

**Session 104-A: Privacy Versus (In)Security—Who Should Win and Why Between Apple and the FBI?**

**SOFTWARE TRACK**

**Forum K-21: Open-Source Software and Flash Memory**

• Building High Performance, High Capacity, Cost-Efficient All-Flash Cloud Storage System with Ceph
• Open Source Software: How the Flash Industry Can Use It Effectively
• Improving Ceph Performance while Reducing Costs
• Ceph Meets NVMe—All-Flash Ceph!
• LightNVM Brings the SSD Flash Translation Layer to the Linux Kernel
• Ceph-High Performance Without High Costs

**SOFTWARE-DEFINED STORAGE TRACK**

**Forum S-12: Flash and Software-Defined Storage**

• All-flash Optimize Software Defined Storage
• Software-Defined Storage Using RDMA and PeerDirect
• The Impact of SSDs on Software Defined Storage
• Using Software-Defined Storage to Manage Flash
• Implementing Storage Abstraction in Existing Legacy Infrastructure
• Optimizing Software-Defined Storage for Flash Memory

**Session 301-E: Flash and Software-Defined Storage**

• Flash + Software-Defined Storage = Path To The Hybrid Cloud

**SPONSORED SESSION TRACK**

**Session MI-1: Micron—Handling Super-Big Data with new NVM Technology**

**Session MI-2: Micron**

**Session MI-3: Micron**

**Session MI-4: Micron**

**SSDS TRACK**

**Forum C-11: Enterprise SSDs**

• How Accelerating SSD Capacities Will Revolutionize Enterprise Storage
• A Comprehensive Approach to Flash-SSD Quality Management for Enterprise
• An Examination of User Workloads for SSDs
• I/O Pattern Based Optimization in SSD
• Delivering on NoSQL Database Performance Requirements with NVMe SSDs
• Designing SSD Firmware Overlays to Reduce Performance Impact

**Forum C-12: SSD Technology**

• Securing the SSDs—NVMe Controller Encryption
• Validating Analytic Write Amplification Models
• Storage Intelligence SSD: Increasing SSD Performance and Lifetime with Multi-Stream Technology
• Eliminating Catastrophic Uncorrectable Read Error (URE) Induced SSD Failures
• Testing Controller Memory Buffer Performance in an NVMe Express SSD
• Standards for Improving SSD Performance and Endurance

**Forum C-22: SSD Concepts**

• Write-hotness Aware Retention Management
• Data Reduction Technologies in SSDs
• Optimizing SSD Architecture for Client Workloads
• Management Schemes of Hybrid SSDs with SLC/MLC Flash Memory: A Survey
• Enabling the Reliable TLC SSD System
• 3-D NAND SSDs Meet Low-Latency Requirements

**TESTING TRACK**

**Forum F-22: SSD Testing**

• Large-Scale Study of In-the-Field Flash Failures
• NVMe Performance—Local vs. Remote
• Comparison of NAND Flash Functionality with Internal Probing and Waveform Analysis
• SSD Production Test for High Volume Manufacturing
• Lifecycle Testing for SSD Production

**Session 102-C: How Flash-Based Storage Performs on Real Applications**

**Session 301-F: Performance Testing**

• Storage Protocol Offload for Virtualized Workloads
• NVMe Cache Modeling for Guaranteed IO Latency

**Session 302-F: Testing Issues, Part 1**

• Performance Assessment of an All-rram Solid State Drive Through a Cloud-Based Simulation Framework
• NAND Flash Status Prediction
• Workload Acquisition for All-Flash Arrays

**Session 303-F: Testing Issues, Part 2**

• Flash Reliability in Production: The Expected and the Unexpected
• Advanced Test Automation and Analytics

**WEARABLES TRACK**

**Session 203-E: How Flash Is a Key to Augmented Reality on Wearables**

**Session 204-E: Analyst Roundtable—Delivering Speed, Performance, and Security to Always-On Devices**

---

**Pre-Register Now**

Register by 8/4 for Discount Pricing

---

**August 8-10, Santa Clara Convention Center**
**Monday**

- **Pre-Conference Day**
  - 8:00 am - 5:00 pm
  - Registration

- **8:30 am - Noon**
  - **PRE-CONFERENCE SEMINAR A**
    - Introduction to 3D NAND
  - **PRE-CONFERENCE SEMINAR B**
    - Introduction to NVM Express (NVMe)
  - **PRE-CONFERENCE SEMINAR C**
    - Persistent Memory
  - **PRE-CONFERENCE SEMINAR D**
    - Flash Storage Networking

- **Noon - 1:00 pm**
  - Lunch

- **1:00 - 1:45 pm**
  - SNIA Tutorial 1: Case for Flash Storage—How It Can Benefit Your Enterprise

- **1:00 - 5:00 pm**
  - **PRE-CONFERENCE SEMINAR E**
    - New Non-Volatile Memory Technologies
  - **PRE-CONFERENCE SEMINAR F**
    - NVMe over Fabrics
  - **PRE-CONFERENCE SEMINAR G**
    - Deploying Flash in the Data Center
  - **PRE-CONFERENCE SEMINAR H**
    - Designing SSD Controllers

- **1:45 - 2:30 pm**
  - SNIA Tutorial 2: Storage in Combined Service/Product Data

- **2:30 - 3:15 pm**
  - SNIA Tutorial 3: Utilizing VDBench to Perform IDC AFA Testing

- **3:30 - 4:15 pm**
  - SNIA Tutorial 4: Implementing Stored-Data Encryption

- **4:15 - 5:00 pm**
  - SNIA Tutorial 5: NVDIMM Cookbook—A Guide to NVDIMM Integration

- **5:30 - 7:00 pm**
  - Solid State Storage Reception

---

**Tuesday**

- **8:00 - 8:30 am**
  - Continental Breakfast

- **8:00 am - 7:00 pm**
  - Registration

- **8:30 - 9:35 am**
  - **APPLICATIONS TRACK**
    - Session 101-A: Mobile Applications
  - **MEDIA/ENTERTAINMENT TRACK**
    - Session 101-B: Flash Memory Meets Film's Rising Capture/Content Requirements

- **1:00 - 5:00 pm**
  - **PRE-CONFERENCE SEMINAR E**
    - New Non-Volatile Memory Technologies
  - **PRE-CONFERENCE SEMINAR F**
    - NVMe over Fabrics
  - **PRE-CONFERENCE SEMINAR G**
    - Deploying Flash in the Data Center
  - **PRE-CONFERENCE SEMINAR H**
    - Designing SSD Controllers

- **1:45 - 2:30 pm**
  - SNIA Tutorial 2: Storage in Combined Service/Product Data

- **2:30 - 3:15 pm**
  - SNIA Tutorial 3: Utilizing VDBench to Perform IDC AFA Testing

- **3:30 - 4:15 pm**
  - SNIA Tutorial 4: Implementing Stored-Data Encryption

- **4:15 - 5:00 pm**
  - SNIA Tutorial 5: NVDIMM Cookbook—A Guide to NVDIMM Integration

- **5:30 - 7:00 pm**
  - Solid State Storage Reception

---

**ENTERPRISE STORAGE TRACK**

- Session U-2: Annual Update on Enterprise Flash Storage

**INVITED TALKS TRACK**

- Flash Memory: Key to Efficient Real-Time Analysis of Big Data

- Keynote 1: Facebook
  - How We Use Flash at Facebook: Tiered Solid State Storage
  - Vijay Rao, Director Technology/Strategy, Facebook

- Keynote 2: Micron
  - Turning Big Data into Critical Business Advantage with Flash Memory
  - Darren Thomas, VP/GM Storage Business Unit, Micron

- Keynote 3: Toshiba
  - New 3D Flash Technologies Offer Both Low Cost and Low Power Solutions
  - Jeff Onshima, Technology Executive, Storage and Devices Solutions Company, Toshiba
  - Yoichiro Tanaka, Sr. Fellow, Toshiba Storage and Electronic Devices Company

- Keynote 4: SanDisk
  - Siva Sivaram, Executive VP Memory Technology, SanDisk

- Keynote 5: Huawei
  - Using Storage Class Memory to Create Scalable Cognitive Computers
  - Balint Fleisher, Chief Research Officer, Huawei

*continued*
Schedule continued • Tuesday / Wednesday  OPEN = Open to all Summit attendees

**Monday**

2:40 - 3:10 pm  
**Keynote 6: Marvell**  OPEN  
Ziming Wu, CTO, Marvell

3:20 - 4:25 pm  
**SECURITY TRACK**  
Session 103-A: Security in a Flash  OPEN  
**MEDIA/ENTERTAINMENT TRACK**  
Session 103-B: Flash Storage and Film Production in the Cloud  OPEN  
**CONTROLLERS TRACK**  
Session U-3: Annual Update on Flash Controllers  
**INVITED TALKS TRACK**  
Session IT-3: Making New Storage-Class Memory Technologies Easier to Adopt  
**SPONSORED SESSION TRACK**  
Session MI-1: Handling Super-Big Data with New NVM Technology—Micron  OPEN

3:20 - 5:45 pm  
**PCIe STORAGE TRACK**  
Forum A-12: NVMe and PCIe SSDs, Part 2  
**ARCHITECTURES TRACK**  
Forum B-12: Flash-Memory Based Architectures—A Technical Discussion, Part 2  
**SSDs TRACK**  
Forum C-12: SSD Technology  
**ENTERPRISE STORAGE TRACK**  
Forum D-12: Enterprise Storage Design, Part 1  
**ENTERPRISE APPLICATIONS TRACK**  
Forum G-12: Enterprise Applications, Part 1  OPEN  
**SOFTWARE-DEFINED STORAGE TRACK**  
Forum S-12: Flash and Software-Defined Storage

4:00 - 7:00 pm  
Exhibits  OPEN  
Exhibit Hall Opening Reception  OPEN

4:35 - 5:45 pm  
**SECURITY TRACK**  
Session 104-A: Privacy Versus (In)security—Who Should Win and Why Between Apple and the FBI?  OPEN  
**MEDIA/ENTERTAINMENT TRACK**  
Session 104-B: Film Storage When the Film Budget Is Yours  OPEN  
**NEW TECHNOLOGIES TRACK**  
Session 201-A: Applying New Non-Volatile Memory Technologies  OPEN  
**ENTERPRISE STORAGE TRACK**  
Session 201-C: Flash Arrays, Part 1  
**ENTERPRISE APPLICATIONS TRACK**  
Session 201-D: Why Flash Should Be Used For Every Workload  OPEN  
**INVITED TALKS TRACK**  
Session IT-5: Future Memories and Today’s Opportunities  
**SPONSORED SESSION TRACK**  
Session MI-2: Micron  OPEN

7:00 - 8:30 pm  
Beer, Pizza, and Chat with the Experts  OPEN

**Tuesday**

2:40 - 3:10 pm  
**Keynote 7: Marvell**  OPEN  
Ziming Wu, CTO, Marvell

3:20 - 4:25 pm  
**SECURITY TRACK**  
Session 105-A: Security in a Flash  OPEN  
**MEDIA/ENTERTAINMENT TRACK**  
Session 105-B: Flash Storage and Film Production in the Cloud  OPEN  
**CONTROLLERS TRACK**  
Session U-4: Annual Update on Flash Controllers  
**INVITED TALKS TRACK**  
Session IT-4: FPGAs/GPUs in Flash Controller Applications  
**SPONSORED SESSION TRACK**  
Session MI-3: Micron  OPEN

3:20 - 5:45 pm  
**ENTERPRISE STORAGE TRACK**  
Forum D-21: Enterprise Storage Design, Part 2  
**SOFTWARE TRACK**  
Forum K-21: Open Source Software and Flash Memory  
**DATA MANAGEMENT TRACK**  
Forum Q-21: Flash in Big Data and Analytics  
**NEW TECHNOLOGIES TRACK**  
Forum R-21: Persistent Memory—Beyond Flash  
**ENTERPRISE APPLICATIONS TRACK**  
Forum G-21: Enterprise Applications, Part 3  OPEN  
**ENTERPRISE STORAGE TRACK**  
Forum D-21: Enterprise Storage Design, Part 2  
**SOFTWARE TRACK**  
Forum K-21: Open Source Software and Flash Memory  
**DATA MANAGEMENT TRACK**  
Forum Q-21: Flash in Big Data and Analytics  
**NEW TECHNOLOGIES TRACK**  
Forum R-21: Persistent Memory—Beyond Flash

9:45 - 10:50 am  
**NEW TECHNOLOGIES TRACK**  
Session 202-A: Flash on the Memory Bus  OPEN  
**ENTERPRISE STORAGE TRACK**  
Session 202-C: Flash Arrays, Part 2  
**CONTROLLERS TRACK**  
Forum E-21: Controllers and Flash Technology, Part 1—Hardware and Algorithms  
**ENTERPRISE APPLICATIONS TRACK**  
Forum G-21: Enterprise Applications, Part 3  OPEN  
**ENTERPRISE STORAGE TRACK**  
Forum D-21: Enterprise Storage Design, Part 2  
**SOFTWARE TRACK**  
Forum K-21: Open Source Software and Flash Memory  
**DATA MANAGEMENT TRACK**  
Forum Q-21: Flash in Big Data and Analytics  
**NEW TECHNOLOGIES TRACK**  
Forum R-21: Persistent Memory—Beyond Flash

**Wednesday**

8:00 - 8:30 am  
Continental Breakfast

8:00 am - 7:00 pm  
Registration

8:30 - 9:35 am  
**NEW TECHNOLOGIES TRACK**  
Session 201-A: Applying New Non-Volatile Memory Technologies  OPEN  
**ENTERPRISE STORAGE TRACK**  
Session 201-C: Flash Arrays, Part 1  
**ENTERPRISE APPLICATIONS TRACK**  
Session 201-D: Why Flash Should Be Used For Every Workload  OPEN  
**INVITED TALKS TRACK**  
Session IT-5: Future Memories and Today’s Opportunities  
**SPONSORED SESSION TRACK**  
Session MI-3: Micron  OPEN

8:30 - 10:50 am  
**CONTROLLERS TRACK**  
Forum E-21: Controllers and Flash Technology, Part 1—Hardware and Algorithms  
**ENTERPRISE APPLICATIONS TRACK**  
Forum G-21: Enterprise Applications, Part 3  OPEN  
**ENTERPRISE STORAGE TRACK**  
Forum D-21: Enterprise Storage Design, Part 2  
**SOFTWARE TRACK**  
Forum K-21: Open Source Software and Flash Memory  
**DATA MANAGEMENT TRACK**  
Forum Q-21: Flash in Big Data and Analytics  
**NEW TECHNOLOGIES TRACK**  
Forum R-21: Persistent Memory—Beyond Flash

9:45 - 10:50 am  
**NEW TECHNOLOGIES TRACK**  
Session 202-A: Flash on the Memory Bus  OPEN  
**ENTERPRISE STORAGE TRACK**  
Session 202-C: Flash Arrays, Part 2  
**CONTROLLERS TRACK**  
Forum E-21: Controllers and Flash Technology, Part 1—Hardware and Algorithms  
**ENTERPRISE APPLICATIONS TRACK**  
Forum G-21: Enterprise Applications, Part 3  OPEN  
**ENTERPRISE STORAGE TRACK**  
Forum D-21: Enterprise Storage Design, Part 2  
**SOFTWARE TRACK**  
Forum K-21: Open Source Software and Flash Memory  
**DATA MANAGEMENT TRACK**  
Forum Q-21: Flash in Big Data and Analytics  
**NEW TECHNOLOGIES TRACK**  
Forum R-21: Persistent Memory—Beyond Flash

continued
Schedule  continued • Wednesday / Thursday  OPEN = Open to all Summit attendees

9:45 - 10:50 am continued

ENTERPRISE APPLICATIONS TRACK
Session 202-D: The Best Way To Solve Killer Performance Problems  OPEN

INVITED TALKS TRACK
Session IT-6: The Business of NAND—Trends, Forecast, and Challenges

SPONSORED SESSION TRACK
Session MI-4: Micron  OPEN

11:00 - 11:30 am

Keynote 7: SK Hynix
NAND Satisfies Both Performance-Based and Cost-Sensitive Enterprise Applications  OPEN
Kyo Won Jin, Sr. Vice President, Head of NAND, SK Hynix

11:35 am - 12:05 pm

Keynote 8: Samsung
3D NAND is the Leadership Technology for Server Storage  OPEN
Jim Elliott, Corporate VP Memory Marketing, Samsung
Jaeheon Jeong, Executive VP R&D, Samsung

Noon - 7:00 pm

Exhibits Open  OPEN

12:05 - 1:00 pm

Lunch

2:00 - 2:30 pm

Keynote 9: Microsemi
The NVMe Inflection Point  OPEN
Derek Dicker, VP/Business Unit Manager—Performance Storage, Microsemi

2:30 - 2:40 pm

Special Presentation 2: IT Brand Pulse Special Innovation Awards  OPEN

2:40 - 3:10 pm

Keynote 10: Seagate
Design Efficient Storage Systems with Both Flash and HDDs  OPEN
Phil Brace, President Cloud Systems and Silicon Group, Seagate

3:10 - 3:40 pm

Keynote 11: EMC  OPEN
TBD, EMC

3:50 - 4:55 pm

NEW TECHNOLOGIES TRACK
Session 203-A: RRAM  OPEN

EMBEDDED SYSTEMS TRACK
Session 203-B: Embedded Applications, Part 1  OPEN

ENTERPRISE STORAGE TRACK
Session 203-C: Flash in Cloud Computing

BUSINESS/MARKETING TRACK
Session 203-D: CMO Panel  OPEN

WEARABLES TRACK
Session 203-E: How Flash Is A Key To Augmented Reality on Wearables  OPEN

INVITED TALKS TRACK
Session IT-7: Opportunities From Our Compute, Network, and Storage Inflection Points

3:50 - 6:15 pm

PCIe STORAGE TRACK
Forum A-22: PCIe/NVMe Storage

SSDs TRACK
Forum C-22: SSD Concepts

CONTROLLERS TRACK
Forum E-22: Controllers and Flash Technology Part 2—Error Correcting Codes

TESTING TRACK
Forum F-22: SSD Testing

NEW TECHNOLOGIES TRACK
Forum M-22: 3-D Flash

5:10 - 6:15 pm

NEW TECHNOLOGIES TRACK
Session 204-A: MRAM  OPEN

EMBEDDED SYSTEMS TRACK
Session 204-B: Embedded Applications Part 2  OPEN

GENERAL TRACK
Session 204-C: Women in the Storage Industry  OPEN

ENTERPRISE APPLICATIONS TRACK
Session 204-D: Selecting the Right Memory For Your Application  OPEN

WEARABLES TRACK
Session 204-E: Analyst Roundtable: Delivering Speed, Performance, and Security to Always-On Devices  OPEN

INVITED TALKS TRACK
Session IT-8: Storage in Media and Entertainment—The Flash Advantage

Pre-Register Now  Register by 8/4 for Discount Pricing

5:30 - 7:00 pm

Exhibits and All-Industry Reception  OPEN

6:00 - 6:30 pm

Best of Show Awards  OPEN

THURSDAY

8:00 - 8:30 am

Continental Breakfast

8:00 am - 2:00 pm

Registration

8:30 - 9:35 am

NEW TECHNOLOGIES TRACK
Session 301-A: Life Beyond Flash—New Non-Volatile Memory Technologies  OPEN

NEW TECHNOLOGIES TRACK
Session 301-B: NVDIMM

NEW TECHNOLOGIES TRACK
Session 301-C: Intel-Micron 3D XPoint™ OPEN

PCIe STORAGE TRACK
Session 301-D: PCIe/NVMe Development Issues

SOFTWARE-DEFINED STORAGE TRACK
Session 301-E: Flash and Software-Defined Storage  OPEN

TESTING TRACK
Session 301-F: Performance Testing

HARDWARE TRACK
Session 301-G: High-Performance Flash Systems  OPEN

DATA CENTERS TRACK
Session 301-H: Is It Time For The All-Flash Data Center?

APPLICATIONS TRACK
Session 301-I: Consumer Applications

INVITED TALKS TRACK
Session IT-9: TechTarget Reveals All … About the Enterprise All-Flash Array Market

continued
8:30 - 10:50 am

CONTROLLERS TRACK
Forum E-3:1: Flash Controller Design Options

9:35 - 9:45 am
Break

9:45 - 10:50 am

NEW TECHNOLOGIES TRACK
Session 302-A: Persistent Memory Applications

HISTORY TRACK
Session 302-B: History Session—The Origins of Silicon Valley

ENTERPRISE APPLICATIONS TRACK
Session 302-C: How Flash Will Transform Enterprise Applications

PCIe STORAGE TRACK
Session 302-D: PCIe/NVMe Extensions, Part 1

FLASH TECHNOLOGY TRACK
Session 302-E: CTO Panel

TESTING TRACK
Session 302-F: Testing Issues, Part 1

PCIe STORAGE TRACK
Session 302-G: Which Interface Is King of the Hill? Should You Build Your All-Flash Array with SAS, SATA, or NVMe?
sponsored by STA, the SCSI Trade Association

FLASH TECHNOLOGY TRACK
Session 302-H: Flash Technology Futures

BUSINESS/MARKETING TRACK
Session 302-I: Secrets of the Flash Marketing Masters

INVITED TALKS TRACK
Session IT-10: Embedded NVM—Automotive and IoT Are Driving the Industry

11:00 am - 2:00 pm

Exhibits Open

11:00 - 11:30 am

Keynote 12: Nimbus
Scaling Flash Storage Efficiently in the Exabyte Era
Tom Isakovich, CEO, Nimbus Data

11:30 am - 12:00 pm

Keynote 13: Crossbar
RRAM—Your Key to Creating Faster, More Scalable Storage
George Minassian, Founder/CEO, Crossbar

12:00 - 12:30 pm

Keynote 14: Mangstor
NVMe over Fabrics Offers Top Performance for Real Time Analytics
Paul Prince, CTO, Mangstor

12:30 - 2:30 pm
Lunch

2:30 - 3:45 pm

BUSINESS/MARKETING TRACK
Session 303-A: Flash Storage from the Other Side—TechTarget Editors Report What Users Think

DATA MANAGEMENT TRACK
Session 303-B: Flash in Big Data Applications

ENTERPRISE STORAGE TRACK
Session 303-C: Major Enterprise Flash Customers Tell It Like It Is

PCIe STORAGE TRACK
Session 303-D: PCIe/NVMe Extensions, Part 2

DATA CENTERS TRACK
Session 303-E: NVMe In Your Data Center—Who, What, Where, When, and Why?
sponsored by the Fibre Channel Industry Association (FCIA)

TESTING TRACK
Session 303-F: Testing Issues, Part 2

BUSINESS/MARKETING TRACK
Session 303-G: Market Research

APPLICATIONS TRACK
Session 303-H: Automotive Applications

GENERAL TRACK
Session 303-I: VC Forum

4:00 - 5:15 pm

NEW TECHNOLOGIES TRACK
Session 304-A: Flash and the Internet of Things

GENERAL TRACK
Session 304-B: Closing Panel on Top Ten Things You Need to Know About Flash Memory Today

APPLICATIONS TRACK
Session 304-C: Accelerating In-Memory Applications with Flash

PCIe STORAGE TRACK
Session 304-D: PCIe/NVMe Fabrics
Lodging

Hyatt Regency (connected to Santa Clara Convention Center)
5101 Great America Parkway, Santa Clara • 408/200-1234
Hyatt Regency is located in the heart of Silicon Valley at the intersection of Tasman Avenue and Great America Parkway, just off Highway 101. Amenities include an outdoor pool, fitness center, free WiFi, and three restaurants.

Hilton
4949 Great America Parkway, Santa Clara • 408/330-0001
Meet. Talk. Engage. You’re in the heart of Silicon Valley for a reason We’re your headquarters for comfort when you’re done with negotiations. With hassle-free service, high speed Internet and quick access to San Francisco and San Jose airports.

Avatar
4200 Great America Parkway, Santa Clara • 408/235-8900
Sync up with Avatar Hotel, the perfect portal to the vibrant technology hub of Silicon Valley. This boutique hotel will keep you connected, rested and comfortable throughout your stay.

Biltmore
2151 Laurelwood Road, Santa Clara • 800/255-9925
With superior accommodations and executive-style amenities, the Santa Clara Biltmore is located just minutes from downtown San Jose businesses, the Santa Clara Convention Center, and California’s Great America. Enjoy the Biltmore’s signature style of unsurpassed luxury and value.

Aloft Santa Clara
510 America Center Court, San Jose • 408/263-3900
Stay & play in style at our tech forward, urban inspired hotel. Designed for the next-generation traveler, you’ll find innovative amenities and enjoy fast, free WiFi in our lounge. Grab a bite to eat or unwind with cocktails.

Pre-Register Now
Register by 8/4 for Discount Pricing