

# Preview Program



The Only Conference Focused Entirely on Flash Memory and Its Applications

August 9-11, 2011

Santa Clara Convention Center  
Santa Clara, California

*Featuring SSDs,  
the New Performance Star  
in Enterprise Storage*

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Register Online: [www.FlashMemorySummit.com](http://www.FlashMemorySummit.com)

## Chairperson's Message



Flash memory today serves as the storage medium in popular mobile devices such as smartphones and tablets. It has also enabled a vast array of products, including embedded systems, consumer storage cards, cache memory, and SSDs for both computer and enterprise applications.

The 2011 Flash Memory Summit has sessions exploring many types of flash applications, including enterprise, embedded, data center, and consumer applications. It also covers SSD controllers, flash storage architectures, reliability, performance, and testing. We have organized the sessions into coherent tracks so attendees can readily identify the ones most relevant to their needs. There will also be a Pre-Conference Workshop on Flash Security and a seminar introducing SSDs, plus a special session celebrating the history of flash memory at Intel (25 years ago).

Technologies such as flash will be major drivers in economic recovery and growth. Coughlin Associates forecasts that by 2015 over 400 exabytes (400 x 10<sup>21</sup> bytes) of flash memory will ship into consumer applications.

Engineers, marketers, and executives all face new challenges. How do you design effectively with flash? What new products can you create—what is the next iPad? How do you manage and secure content? How long does the stored data last and how can you increase its lifespan? Find the answer to these and many other questions at the Flash Memory Summit.

We look forward to seeing you there!

**Tom Coughlin**  
Conference Chairperson  
President, Coughlin Associates

## Summit Sponsors

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## Summit Highlights

# The only conference focused entirely on flash memory and its applications!

Featuring SSDs, the new performance star in enterprise storage!

Are you struggling with crucial Solid State Drive (SSD) decisions? Can SSDs resolve your application bottlenecks? How can you maximize SSD performance? Flash Memory Summit will help you make the right choices. It's the only conference focused entirely on flash memory and SSDs, the new frontier in enterprise storage.

- Major Exhibitors • Key Subjects • Leading Experts
- Latest Products and Solutions

### Highlights

- Pre-conference Workshop on Flash Security and Seminar on SSD Fundamentals
- Forums and tutorials on enterprise storage systems, architectures, caching, application integration, SSDs, embedded applications, and cloud computing
- Keynotes from Oracle, Intel, SMART Modular, SanDisk, Dell, Stec, Micron, Memoright, and Seagate
- Special Plenary Session on the 25-year history of Flash Memory
- Market Research Session featuring top analysts

**Exhibit-only registrants** may attend keynotes, expert table session (with beer and pizza), plenaries, market research session, and many other sessions for free!

■ *“The NAND market has grown faster than any technology in the history of semiconductors.”*

Jim Handy, Objective Analysis



## Best of Show Awards

These Awards provide an opportunity for your company's products and solutions to receive industry recognition. Don't miss this chance to be in the limelight! Entry forms, deadlines and rules online: [www.FlashMemorySummit.com](http://www.FlashMemorySummit.com)

### CATEGORIES

- **Most Innovative Flash Memory Consumer Application**
- **Most Innovative Flash Memory Enterprise Business Application**
- **Most Innovative Flash Memory Technology**
- **Most Innovative Flash Memory Customer Implementation**



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FMS Theatre will be located in the exhibit hall and is designed specifically for demonstrations and sales talks. Trumpets, trinkets, and other theatrical props are completely welcome! Please visit [www.FlashMemorySummit.com](http://www.FlashMemorySummit.com) for details.

## Become an Exhibitor and/or Sponsor

For exhibiting and sponsorship opportunities please email [alan@FlashMemorySummit.com](mailto:alan@FlashMemorySummit.com).

## Reasons to Attend This Year's Summit

### Value

Best-practice-based education at a cost of about \$40 per session: where else will your organization's training program find that kind of value?

### 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!

### Industry Visionaries

Flash Memory Summit brings together the industry's most brilliant and prolific minds. Hear first hand from leaders in every area of specialization.

### Networking

Talk with key product suppliers; hear from others with similar questions and issues; 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.

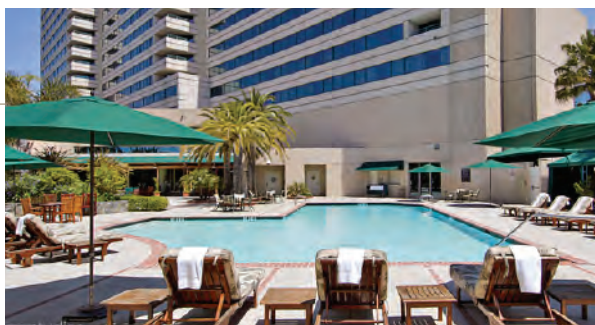
### Early-Bird Discounts

Early registration means real savings—enough to put a substantial dent in travel and lodging expenses. To register visit [FlashMemorySummit.com](http://FlashMemorySummit.com).

## Join the sharpest minds in the world of flash memory and SSDs!

- Explore the latest consumer, data center, enterprise, and embedded applications
- Learn about advances in security, software, and new technologies
- Get up to speed on solid state drives
- Hear the latest market research
- Network with leading companies, peers, and potential suppliers and customers

## Lodging



Hyatt Regency Santa Clara  
5101 Great America Parkway  
Santa Clara, California 95054  
**Reservations: 800/233-1234**

Santa Clara's Hyatt Regency is located in the heart of Silicon Valley—just seven miles from San Jose Int'l Airport and 30 miles from San Francisco Int'l Airport—adjacent to the Santa Clara Convention Center and Flash Memory Summit. A special rate of \$159 nightly (single/double plus tax) is offered to Summit attendees August 7-11. Please reserve by July 7. Be sure to mention that you are attending the Summit!

For complete details visit [FlashMemorySummit.com](http://FlashMemorySummit.com)

### SUMMIT STAFF

Tom Coughlin, Conference Chair  
Lance Leventhal, Program Chair  
Chip Stockton, Conference Director & Manager  
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Jim Handy, Senior Program Advisor  
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Tricord Tradeshows, Exhibits Contractor

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Troy Winslow, Intel  
Joe Zipperer, MOD Systems

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Joy Donohue, Smart Modular Technologies  
Mahshid Gomarooni, STEC  
Rob Hart, Datalight

## Keynote Presentations

### Keynote 1: The Alchemy of NAND Flash

*Glen Hawk, Vice President - NAND Solutions, Micron Technology*

Tuesday 11:30 am - Noon



NAND Flash has enabled a new way of interacting with the world. We've seen it unleash the potential of today's mobile and personal computing devices, and it's creating a storm in the cloud. Makers of ultrabooks, tablets, and smartphones want smaller, more advanced Flash storage technology to create thinner, lighter and lower cost devices, but they want it without the increasing management challenges associated with process shrinks. To overcome these burdens, NAND must be coupled with intelligent management engines. And as the back-end infrastructure to cloud computing, data centers are adopting high-performance SSDs to reduce the data latency that has largely hindered organizations and consumers in their move to the cloud.

*Glen Hawk joined Micron in May 2010 from Numonyx, where he was Vice-President and General Manager of the Embedded Business Group. He was previously General Manager of the Flash Product Group at Intel. Mr. Hawk has 26 years of semiconductor industry experience, all focused on NVMs. He was with Intel's flash business from the beginning. He has held positions in technology development, product engineering, design engineering, quality and reliability engineering, and marketing. Mr. Hawk holds a BS in chemical engineering from the University of California, Berkeley.*

### Keynote 2: The Age of Application-Specific SSD

*Eric Kao, CEO and Chairman, Memoright*

Tuesday 1:00 - 1:30 pm



Due to the nature of flash memories, it is impossible to produce an SSD that does everything well. Flash media has many more parameters than do hard drives. The large disparity of read and write programming times, large page size, and block erasure characteristic demand tradeoffs among different approaches to mapping schemes and housekeeping algorithms. Cost is not the only issue here; form factors, capacity, and bandwidth also play a role. Different access patterns call for different architectural and firmware approaches. In fact, the diversity is increasing with new advances in flash technology. We will present data from several approaches with varying tradeoffs with regard to resources and performance.

*Eric Kao is Chairman and CEO of Memoright, which he joined in 2008. He was previously founder and chairman of Socle, an ASIC service provider; CEO of Xander, a major IT distributor in China; co-founder of Paradigm Ventures; and Vice-President of Asia Pacific Investment. He also has experience with Mentor Graphics and Cadence. He graduated from Taiwan's National ChaoTung University with a BA degree in electrical engineering, and he later received an MSEE degree from UC Berkeley.*

### Keynote 3: TBD

*Sanjay Mehotra, SanDisk*

Tuesday 1:30 - 2:00 pm

### Keynote 4: It's Not Your Father's Hard Drive Or Is It?

*John Scaramuzzo, SMART Modular*

Wednesday 11:00 - 11:30 am



Until recently, solid state drives have been used almost exclusively as higher-performance improved-reliability replacements for hard disk drives. Their lower total cost of ownership and higher performance have made SSDs an attractive solution for certain application environments. However, their much higher cost per gigabyte has been an obstacle to achieving broader adoption. It's time now to think outside the box. Today's designers are already using SSDs to enable next-generation storage architectures. In fact, they are taking the market well beyond simple drop-in replacements for hard drives, and SSDs are become an intriguing storage solution in and of themselves. Ironically, SSD designers are taking cues from the hard drive industry when it comes to optimizing architectures while enabling the lowest cost solutions.

*John Scaramuzzo joined the SMART team in January 2010 as senior vice president and general manager, Storage Business Unit. Before joining SMART, John held management and product development positions at Seagate, Maxtor, Quantum, and Digital Equipment. Most recently, he was the senior vice president and general manager of Seagate's Enterprise Compute business unit. He holds a BSEE from Boston University, an MS in Electrical Science from Harvard, and three US patents related to disk-drive technology and applications.*

*continued*

## Keynote Presentations - continued

**Keynote 5: Mythbusting Flash Performance**

*Bill Nesheim, VP of Solaris Platform Engineering, Oracle*

Wednesday 11:30 am - Noon



Today's number one myth in the computer storage world is, "Everything is faster with flash." It simply is not true. High IOPs alone are not enough to satisfy the needs of enterprise end users and their critical applications. Adoption of flash memory has been increasing rapidly among the most demanding enterprise customers. This presentation will discuss the keys to maximizing the benefits from that adoption in areas ranging from integrated systems such as the Exadata Database Machine to strictly software applications. It will also address requirements for promoting even broader future use of flash technology in enterprise data centers.

*Bill Nesheim joined Oracle with the Sun acquisition in 2010. During his 16 years at Sun, Bill held technical leadership positions for systems software within the Solaris and Systems organizations, working across the microelectronics, software, and systems hardware divisions. Before joining Sun, Bill designed and developed systems software at massively parallel supercomputer manufacturer Thinking Machines. A graduate of Cornell University, Bill holds several patents in the areas of cluster interconnect technology, system software support for NUMA systems, massively parallel systems, and high performance I/O. Bill is based at Oracle's Burlington, MA engineering center.*

**Keynote 6: TBD**

*Paul Prince, Director and CTO - Enterprise Product Group, Dell*

Wednesday 2:00 - 2:30 pm



*As Director and CTO for Dell's Enterprise Product Group, Paul Prince is responsible for technology strategy and planning. He and his team lead technology development and integration across Dell's enterprise solutions portfolio, including servers, storage, networking, and software products. Paul has over 20 years industry experience in the planning and development of enterprise systems architectures. By leveraging the best ingredients from the open systems industry, and driving significant customer-related capabilities, Paul and the CTO team have been integral to Dell's continuing focus on building and delivering open, capable, and affordable solutions.*

**Keynote 7: The Next Frontier in NVM Performance**

*Knut Grimsrud, Intel*

Wednesday 2:30 - 3:00 pm



Solid state drives have revolutionized computing by offering high performance, great portability, and a new level of system responsiveness. However, it is still the fact that SSDs today are based largely on underlying NVM storage technology and interfaces that are far from new. The next advances in NVM

performance will produce yet another leap in capabilities with far-reaching effects on every aspect of computing. This will stress traditional interfaces and hence require new approaches to connectivity and system software. The end result will be to enable new categories of storage devices that have no direct equivalent today.

*Knut Grimsrud is responsible for the architectural definition of Intel's SSDs and leads a research and development group focusing on innovations for mainstream & consumer storage. Knut joined Intel in 1993 as a hardware engineer in the Intel Architecture Labs where his primary focus was on improving the storage performance of Intel's entry into the standard high-volume server segment. His focus transitioned to mainstream storage optimization techniques in the Platform Architecture Labs where his contributions included disk reorganization techniques for improved application launch performance. Knut then drove definition of the Serial ATA disk drive interface standard and its subsequent evolutions and enhancements, which continues today under his group in the Storage Technologies Group.*

**Keynote 8: TBD**

*Scott Stetzer, STEC*

Thursday 11:00 - 11:30 am

**Keynote 9: TBD**

*TBD, Seagate*

Thursday 11:30am - Noon



# Schedule

(P): Paid registrants only.

## Monday, August 8

[8:30 am - 5:00 pm](#)

### Pre-Conference Workshop: Flash Security (P)

8:30am-Noon: Morning Session

- Flash Security – Future Trends in Technologies and Standards
- NAND Flash Security
- Using Self-Encrypting Storage Devices Today and Tomorrow
- Solid-State with Self-Encryption: Solid and Safe

11:00am-Noon: Panel—Is Flash Memory Secure Today?

Noon-1:00pm: Lunch and Table Exhibits

1:00-5:00pm: Afternoon Session

- A PC in Every Pocket
- Reliably Erasing Data from Flash-Based Solid State Drives
- Tradeoffs in Secure Flash Design
- Speed Is Great, But What About Security?

2:45-3:00pm: Afternoon Break

4:00-5:00pm: Panel—Future of Flash Security

[1:00 - 5:00 pm](#)

### Pre-Conference Seminar: Introduction to SSDs (P)

## Tuesday, August 9

[8:00 - 8:30 am](#)

### Registration/Continental Breakfast

[8:30 - 11:20 am](#)

### Forum 1A: Pairing Flash Memory and Disk Drives in Computers (P)

- Solid State Storage Caching Comes to the Client Segment
- Flash Memory and HDD in Computers: Better Together
- Benchmarking Paired Storage
- Hybrid Hard Drives
- PC Performance Trends and Technology

### Forum 1B: Flash Memory-Based Architectures—A Technical Discussion, Part 1 (P)

- NAND Flash Architecture and Specification Trends
- Optimizing Block Operations via the Flash Translation Layer

- Designing Reliable Enterprise SSDs with Low-Cost Media
- An Insider's Look at Flash Controller Design

### Forum 1C: Enterprise SSDs (P)

- Opportunities and Challenges of Using Solid State Drives in Large Scale Datacenters
- How the SSD Engine Really Works?
- Differentiation in the SSD Market: Opportunity for the Enterprise
- Flash Forward for Reliable Data Protection and Recovery
- SAS SSDs – Building Blocks for High-Performance Storage

[8:30 - 9:50 am](#)

### Session 101: Which Interface Will Be Boss for Solid-State Storage? (P)

### Session 102: SSD Performance Benchmarking (P)

[10:10 - 11:25 am](#)

### Session 103: Implementing SSDs for Oracle (P)

### Session 104: High-Speed Interchip Communications (P)

- SSD Subsystem Chip-to-Chip Interfaces
- 400 MT/s NAND Interface Solutions
- Signal Integrity Challenges for High Speed Low Profile Disk Drive

[11:30 am - Noon](#)

### Keynote 1: The Alchemy of NAND Flash

Glen Hawk, Micron

[Noon - 1:00 pm](#)

### Lunch

[1:00 - 1:30 pm](#)

### Keynote 2: The Age of Application-Specific SSD

Eric Kao, Memoright

[1:30 - 2:00 pm](#)

### Keynote 3: TBD

Sanjay Mehrotra, SanDisk

[2:10 - 4:45 pm](#)

### Forum 2A: Hybrid Memory Systems (P)

- Disruptive Hybrid Storage: Fusing DRAM and NAND
- Updating the Computer Memory Hierarchy
- NVM: Refocusing on Memory, Not Storage, Hierarchies
- Flash Memory for Buffer Caches
- Rethinking Cache Data Protection

### Forum 2B: Flash Memory-Based Architectures—A Technical Discussion (Part 2) (P)

- The Future of SSD Architectures
- Architectural/Feature Requirements to Support MLC NAND
- Flash Memory- Aware Software Architectures and Applications
- Solid State Storage Architectures in the Modern Data Center

### Forum 2C: Solid State Drive (SSD) Technology (P)

- Signal Integrity Challenges for HighSpeed Low Profile Disk Drive Connector
- An Analysis of Flash and HDD Technology Transfer
- Power Design Issues for Enterprise SSD
- The OpenSSD Project: Research and Education on the Real SSD Platform
- Differentiating Quality Between SLC, eMLC, and MLC
- SSD Trim Commands Significantly Reduce Necessity of Overprovisioning

[2:10 - 3:20 pm](#)

### Session 105: SSD Testing (P)

- Enterprise Performance Test Metrics
- Emerging SSD Performance Tests
- A Close Look at PCI Express SSDs
- Accurately Measuring SSD Performance

### Session 106: Security (P)

- Security Concerns in Flash-Based Storage
- ASIC Tools for DPA Prevention
- Extracing Device Fingerprints from Flash Memory
- Solid State Drive Security

*continued*

**Schedule** *Continued***(P):** *Paid registrants only.*3:30 - 4:45 pm**Session 107: Standards (P)**

- NVM Express: The Interface Standard for PCI Express SSDs
- DDR800 Arrives
- SAS Anchors Enterprise SSD Deployment
- The New SDA Ultra High Speed Standard Improves System Performance
- SSD Connectorization Standards for Enterprise Storage

**Session 108: NOR Flash Memory—Instant on Experience in Electronics (P)**4:45 - 5:45 pm**Plenary Session: Flashback—The Story of Flash Memory**6:00 - 7:30 pm**Beer, Pizza, and Chat with the Experts**

- Embedded Applications
- Standards
- Security
- Enterprise Applications
- Consumer Applications
- New Technologies
- Markets
- Reliability/Endurance/Performance
- SSDs
- MLC Flash
- Controllers
- Data Recovery
- Software
- Database Applications
- MRAM

**Wednesday, August 10**8:00 - 8:30 am**Registration/Continental Breakfast**8:30 - 10:50 am**Tutorial 1A: Next-Generation Controllers 1—Inside the Latest Developments (P)**

- Could We Make SSDs Self-Healing?
- Garbage Collection – Understanding Foreground vs. Background Garbage Collection and Other Related Elements
- A New Era in Embedded Flash Memory

- Designing SSD Controllers for Enterprise Applications
- Flash Controller Solutions and Programmable Technology
- Error-Correcting Codes for TLC Flash

**Tutorial 1B: Enterprise Storage Applications (P)**

- Exploring Form Factor Evolution in Enterprise Server Applications
- MLC Endurance: Enabling the Enterprise SSD Market
- MLC Flash for Enterprise Storage Performance
- SPC Case Study on Consistent Performance
- Mission Critical SSD Applications
- Flash Memory Arrays for Enterprise Applications

**Tutorial 1C: Testing/Performance/Endurance (P)**

- Enterprise SSD Competitive Analysis
- Accelerating Benchmark Testing Through Automation
- Changing Dynamics of Flash Performance Benchmarks
- Reliability in the Enterprise: How to Ensure Flash-Based SSDs Make the Grade

8:30 - 9:45 am**Session 201: Challenges and Advances in Data Recovery of SSDs****Session 202: Consumer Applications**

- Streaming Media: The Ultimate Threat to NAND
- Tailor Flash Storage Solutions to Different Needs
- Looking Ahead at Flash Memory
- Storage Strategies for Consumer Electronics

10:00 - 10:50 am**Session 203: User Experiences with Enterprise SSDs (P)****Session 204: Tablets**

- Tablet Market Segmentation
- The Rise of Tablets
- Leveraging Serial ATA for Small Form Factor Applications
- Evolution of Tablets

11:00 - 11:30 am**Keynote 4: It's Not Your Father's Hard Drive Or Is It?**

John Scaramuzza, SMART Modular

11:30 am - Noon**Keynote 5: Mythbusting Flash Performance**

Bill Nesheim, Oracle

Noon - 1:00 pm**Lunch**Noon - 2:00 pm**Exhibits Open**2:00 - 2:30 pm**Keynote 6: TBD**

Paul Prince, Dell

2:30 - 3:00 pm**Keynote 7: The Next Frontier in NVM Performance**

Knut Grimsrud, Intel

3:10 - 5:30 pm**Tutorial 2A: Next-Generation Controllers, Part II—Decoding the Future (P)**

- Error Correction Scheme for Constrained Inter-Cell Interference in Flash Memory
- Architecture Customized Constrained Coding for Flash Memory
- High-Efficiency SSD for Data Reliable Storage System
- IM NAND for Compute Applications
- Improving NAND Reliability with Low-Density Parity Check Codes (LDPC) and Optimizing Read Voltage (ORV)
- Advanced Management of 3bpc eMMC Devices

**Tutorial 2B: Tiered Storage (P)**

- Accelerating Metadata-Intensive Namespace Operations in NAS Workflows
- What Does Tiered Storage Really Do to Performance?
- Beyond Block I/O: Exposing Native Flash Translation Layer (FTL) Capabilities

*continued*

**Schedule** *Continued***(P):** *Paid registrants only.*3:10 - 4:15 pm**Session 205: RRAM****Session 206: What, Me Worry?  
Erasure of SSDs—Is It an Issue?****Session 207: Data Center  
Applications**

- Virtual Desktops: The Invisible I/O Bottleneck
- Flash and DRAM Storage Solutions for Real-World Problems
- Datacenter Efficiency: What Are the Appropriate Metrics to Consider?
- Solid-State Drive (SSD) System Optimizations in Datacenter Applications

4:30 - 5:30 pm**Session 208: MRAM****Session 209: Green Flash**

- Energy Star for Data Centers
- Creating Sustainability Through Flash Storage
- Green Flash Requires Green Software

**Session 210: Embedded Applications**

- Emerging Embedded Storage Solutions
- Rugged Solid State Drive in a Single BGA Package

5:30 - 7:30 pm**Exhibits Open**5:30 - 6:30 pm**All-Industry Reception**6:00 pm**Flash Memory Awards Ceremony****Thursday, August 11**8:00 - 8:30 am**Registration/Continental Breakfast**8:30 - 10:50 am**Tutorial 3A: Software for Flash-Based  
Systems (P)**

- You Should Not Have to Be a Scientist to Clone
- Benefits and Pitfalls of Flash Memory on Linux
- New NV-RAM Technologies: Which Database Management Systems Fits?
- exFAT: A File System for Flash Memory

- Flash as a Cache: Challenges and Opportunities
- Flash Databases: High Performance and High Availability

8:30 - 9:40 am**Session 301: PCIe Storage 1 (P)**

- PCIe and Solid State; Myths and Facts and What Lies Ahead
- Onyx: A Prototype Phase-Change Memory Array
- Toward a Million IOPS

**Session 302: Nonvolatile Design  
Challenges and Methodologies (P)****Session 303: Life Beyond Flash—New  
Non-Volatile Memory Technologies**

- Current and Emerging Memory Technology Landscape
- Latest Advances and Roadmap for STT-RAM

9:50 - 10:50 am**Session 304: Enterprise SSDs (P)**

- Enterprise SSDs and the Holy Grail
- Exploiting SSDs with ZFS
- Accelerating the Pace of SSD Innovation
- Enterprise MLC NAND Industry Comparison

**Session 305: Flash Controller Design  
(P)**

- Designing Scalable, Configurable SSD Controllers
- Signal Processing Scheme for MLC Channel Model
- Flexible Error Correction Schemes for Multilevel Flash
- System Benefits of EZNAND/Enhanced ClearNAND Flash

**Session 306: Future of Phase Change  
Memory—Technology and  
Applications****Special Session: New Approaches to  
Enterprise Server Solutions**

- Enabling Flash and SSD for Virtualized Environments
- SSD Storage Architectures: Which One Is Right for You?
- Challenges of Implementing Automated Tiering in Enterprise Servers

11:00 - 11:30 am**Keynote 8: TBD**  
Scott Stetzer, STEC11:30 am - noon**Keynote 9: TBD**Noon - 1:00 pm**Lunch**Noon - 2:00 pm**Exhibits Open**2:00 - 2:30 pm**Keynote 10: TBD**2:40 - 3:40 pm**Session 307: PCIe Storage 2 (P)**

- PCIe Performance in Small Package!
- Optimizing SSDs with PCI Express
- PCIe SSD Storage Solutions

**Session 308: Mobile Applications**

- Mobile Storage: Trends for Tomorrow
- Digital Content Delivery in the 21st Century
- SD Card Based eBook Application for Mobile Devices
- NAND Comparisons for Portable Consumer Products

**Special Session: SSD Design**

- High Density Stacked SSDs
- Silicon MEMS Timing Solutions for SSDs

3:45 - 5:00 pm**Session 310: Closing Panel on Top  
Ten Things You Need to Know about  
Flash Memory Today****Special Open Tutorial: Flash Memory  
and Cloud Computing**

- Cloud Computing and SSDs
- Optimizing the IT/Server Ecosystem for Cloud Computing
- Block Storage as a Service in the Cloud
- Leveraging SSDs within Cloud Storage Infrastructures

## Our thanks to this year's speakers.

### Mostafa Abdulla

Senior Manager, Micron

### Michael Abraham

Applications Engineering Manager, Micron

### Vijay Ahuja

President, Cipher Solutions

### Ameen Akel

Graduate Student, UCSD

### Fari Assaderaghi

VP Engineering, SiTime

### Greg Atwood

Micron Sr. Fellow, Process R&D, Micron

### James Bagley

Sr. Analyst, Storage Strategies NOW

### Saujit Bandhu

Sr. Principal Engineer, 3M Innovation

### Don Barnetson

SVP Marketing, DDT Software

### Eyal Bek

SSD Product Mktg Mgr, SanDisk

### Karl Bendorf

Sr. Associate, Vion

### Brian Berg

President, Berg Software Design

### Amit Berman

Graduate Student, Israel Institute of Technology

### Dileep Bhandarkar

Distinguished Engineer, Microsoft

### Brad Bickford

Director of Strategic Planning, Intel

### Walker Blount

VP Storage Systems, Web-Foot Research

### Chris Bross

Senior Recovery Engineer, DriveSavers Data Recovery

### Steven Brown

Dir Marketing EDA, Cadence

### Tom Burniece

President, Burniece Consulting Services

### John Busch

Chairman/CTO, Schooner Information Technology

### James Candelaria

CTO, WhipTail Technologies

### Jim Cantore

President, JLC Associates

### Jason Caulkins

Chief Technologist, Dataram

### Krishna Chander

Principal Analyst, Chander Consulting

### George Chang

Product Management Manager, Innodisk

### Young-Joon

Sr. Vice President, ADATA Technology

### Bsa Chung

Dir. of Product Mktng, SanDisk

### Steve Cliadakis

General Manager, Spin Transfer Technologies

### Brendan Collins

VP, Hitachi Global Storage Technologies

### Jim Cooke

Senior Manager, Micron

### Tom Coughlin

President, Coughlin Associates

### Alvin Cox

Senior Staff Engineer, Seagate

### Marty Czekalski

Architecture Program Manager, Seagate

### Radoslav Danilak

CEO, StorCloud

### Erik de la Iglesia

Chief Architect, GridIron Systems

### Thom Denholm

Technical Product Manager, Datalight

### Kathy Diehl

Energy Star Program Manager, US Environmental Protection Agency

### Nelson Duann

Product Mktg Dir., Silicon Motion

### David Eggleston

CEO, Unity Semiconductor

### Sean Eilert

Senior Principal Engineer, Micron

### Mike Engbretson

Chief Technology Engineer/ CEO, Granite River Labs

### Hany Eskandar

Senior Principal Engineer, Western Digital

### Rich Fetik

President, Data Confidential

### Alessandro Fin

VP Solid State Storage Product Development, SVS

### Jim Fitzpatrick

Principal Engineer, SMART Modular Technologies

### Monty Forehand

Development Engineering Director, Seagate

### Brady Foster

Senior Technical Marketing Engineer, Intel

### Tasha Frankie

Graduate Student, UCSD

### Guy Freikorn

Product Marketing SSD, SanDisk

### Holly Frost

CEO, Texas Memory Systems

### Walter Fry

Client System Design Fellow, AMD

### Ryan Gabrys

PhD Student, UCLA

### Steve Garceau

Director of Technical Marketing, Viking Modular

### John Goldman

Director Industry Standards, Lexar Media

### Bryan Gillson

Senior Director Product Management, Symantec

### Ilana Golan

Technical Director, QualiSystems

### Steve Graves

CEO, McObject

### Knut Grimsrud

Intel Fellow/Director, Storage Architecture, Intel

### Edward Grochowski

Computer Storage Consultant

### Terry Grunzke

Senior Applications Engineer, Micron

### Jim Handy

Director/Chief Analyst, Objective Analysis

### Logan Harbaugh

Independent Consultant

### Jim Harrison

West Coast Editor, Electronic Products Magazine

### Rob Hart

Dir. of Mktg Programs, Datalight

### Glen Hawk

VP NAND Solutions, Micron

### Troy Hegr

Data Recovery Technology Manager, Kroll OnTrack

### Steffen Hellmold

VP Marketing, Everspin

### Troy Hicks

VP Engineering, Revere Security

### Jonathan Hinkle

Memory Systems Architect, Viking Modular Solutions

### Easen Ho

CTO/COO, Calypso Systems

### Barry Hoberman

CMO, Crocus Technology

### Jonathan Hubert

Director of Strategic Marketing, Lexar Media

### Amber Huffman

Principal Engineer, Intel Storage Technologies Group

### Woody Hutsell

Application Acceleration Practice Director, Vion

### Tom Isakovich

CEO, Nimbus Data

### Khurram Ismail

Senior Applications Engineer, Micron Technology

### Shirish Jamthe

Global Director of Sales Engineering, Virident

### Steve Johnson

Distinguished Engineer, LSI Storage Components Division

### Vikram Joshi

CTO, I/O Turbine

### Avo Kanadjian

VP Marketing, Spansion

### Eric Kao

CEO/Chairman, Memoright

### Vijay Karamcheti

CTO, Virident

### Akber Kazmi

Mktg Dir., PLX Technology

### Badriddine Khessib

Performance Architect, Microsoft

### Eden Kim

CEO, Calypso Systems

### Avi Klein

Senior Principal Engineer, SanDisk

### Darryl Koivisto

CTO, Mirabilis Design

### John Koob

PhD Candidate, University of Alberta

### Michael Kozicki

Chief Scientist, Adesto

### Jay Kramer

VP Marketing, Astute Networks

### Mohamad Krounbi

SVP/GM R&D, Grandis

### Michael Laflin

Director of Marketing, Enpirion

### Narinder Lall

Dir. of Product Marketing, eASIC

### Daryl Lang

Director of Storage Product Management, OCZ Technology

### Ron LaPedis

Director Product Management and Marketing, SPYRUS

### Pierre Lartigues

Field Application Engineer, 3D PLUS

### Carla Lay

Applications Engineer, Micron Technology

### Sang-Won Lee

Professor, Sungkyunkwan University, Korea

### David Lin

VP Marketing, NVELO

### Kevin Marks

Principal Engineer/Technology Strategist, Dell

*continued*

*This year's speakers - continued***Harry Mason**

Director of Industry Marketing, Storage Components Group, LSI

**Duncan McCallum**

CEO, Velobit

**David McIntyre**

Manager, Computer/Storage Business Unit, Altera

**Sanjay Mehrotra**

CEO, SanDisk

**Bob Merritt**

Partner, Convergent Semiconductors

**Claus Mikkelsen**

Chief Scientist, Hitachi

**Andy Mills**

CEO, Enmotus

**John Moon**

Senior Director, Emerging System Integration, Seagate Technology

**Ravi Motwani**

Error Control Coding/DSP Architect, Intel

**James Myers**

Apps Engineering Manager, Intel

**Doron Myersdorf**

Senior Director of Marketing Management, SanDisk

**Jay Neer**

Strategic Standards Mgr, Molex

**Rick Neff**

Marketing Manager, SMART Modular Technologies

**David Nellans**

Sr. Software Engineer, Fusion-io

**Bill Nesheim**

VP Solaris Platform Engineering, Oracle

**Tinh Ngo**

Director Strategic Marketing, Viking Modular Solutions

**Janice Nickel**

Program Manager, Hewlett-Packard Laboratories

**Alan Niebel**

CEO, Web-Foot Research

**Shuki Nir**

Sr VP Retail, SanDisk

**Dmitry Obukhov**

Firmware Security Mgr, SandForce

**Larry O'Connor**

CEO, Other World Computing

**Bob O'Donnell**

VP Clients and Displays, IDC

**Aaron Olbrich**

CTO, Pliant Technology

**Thad Omura**

VP Marketing, SandForce

**Peter Onufryk**

Director of Engineering, IDT New Jersey Design Center

**Doreet Oren**

Director of Product Marketing SSD, SanDisk

**Gary Orenstein**

VP Product and Technical Marketing, Fusion-io

**Ken Ow-Wing**

Sr. Product Line Mgr, Violin Memory

**Kiran Pangal**

Principal Engineer, Intel

**Jim Pappas**

Director Initiative Marketing, Intel Server Platforms Group

**Chuck Paridon**

Performance Architect, Hewlett-Packard

**Donghyuk Park**

PhD Student, Soongsil University, Korea

**Craig Parris**

Senior Staff Engineer, Seagate

**Robert Pierce**

Senior Director of Flash Products, Cadence Design Systems

**Harry Pon**

NAND Product Dev, Intel

**Jim Porter**

Owner, DISK/TREND

**Pravin Prabhu**

Undergraduate Student, UCSD Non-Volatile Systems Laboratory

**Jay Prassl**

VP Marketing, SolidFire

**Lee Prewitt**

Senior Program Manager, Microsoft

**Paul Prince**

CTO, Dell

**Adrian Proctor**

VP Marketing, Viking Modular Solutions

**Nagesh Puppala**

Segment Director, Intel Netbook and Tablet Group

**Minghai Qin**

Ph.D. Student, UCSD

**Tahmid Rahman**

Technical Marketing Engineer, Intel

**Doug Rainbolt**

VP Marketing, Alacritech

**Doug Rollins**

Senior Applications Engineer, Micron Technology

**Stephan Rosner**

VP Software and Systems, Spansion

**Bernie Rub**

VP/CTO Storage Business Unit, SMART Modular Technologies

**Dror Sal'ee**

CTO, Anobit Technologies

**Ted Sanford**

CEO, FlashSoft

**John Scaramuzzo**

Sr VP/GM, SMART Modular Technologies

**Roland Schuetz**

Senior System Architect, MOSAID Technologies

**Bob Scranton**

Consultant, First Ocean Consulting

**Eric Seidman**

Senior Product Marketing Manager, Isilon Systems

**Sudipta Sengupta**

Research Scientist, Microsoft

**Scott Shadley**

Director of SSD Technical Marketing, STEC

**Steven Shrader**

Senior Architect, Cadence Design Systems

**Kent Smith**

Senior Director of Product Marketing, SandForce

**Chuck Sobey**

President, ChannelScience

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**Sean Stead**

Director, NTI

**Rick Stehno**

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**Brad Stone**

VP Product Mgmt, Nexenta Systems

**Mike Strickland**

Director of Marketing, Altera

**Phillip Swart**

Technical Marketing Mgr, Netlist

**Farhad Tabrizi**

CEO, Grandis

**Robert Thibadeau**

Sr. VP/Chief Scientist, Wave Systems

**Ben Thiel**

Product Manager, Micron

**Robert Thompson**

Dir. Smart Mobile Devices, Freescale

**Gary Tressler**

Sr. Technical Staff Member, IBM

**Keiichi Tsutsui**

Sr. Manager Advanced Memory Systems R&D, Sony

**Anil Vasudeva**

President, IMEX Research

**Denis Vilfort**

Sr. Dir. Product Marketing, EMC

**Kevin Vlasich**

Cryptography and Information Security Specialist, Imation

**Andy Walls**

Distinguished Engineer/Storage Hardware Architecture, IBM

**Michael Wei**

Graduate Researcher, UCSD

**Hanan Weingarten**

CTO, DensBits

**Steve Weinger**

Dir. NAND Marketing, Samsung

**Bob Weisickle**

CEO, OakGate Technology

**Jeremy Werner**

Director of Marketing, SandForce

**Michael Willett**

Storage Security Strategist, Samsung

**Alex Winokur**

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**Troy Winslow**

Director of Marketing, Intel

**Doug Wong**

Member of Technical Staff, Toshiba America Electronic Components

**Gregory Wong**

President, Forward Insights

**Teresa Worth**

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**Dave Wright**

CEO, SolidFire

**C.C. Wu**

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**Swapna Yasarapu**

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**Allen Yu**

Sr. Mgr. Technical Strategy, Phison

**Tong Zhang**

Associate Professor, Rensselaer Polytechnic Institute

**Wei Zhou**

Engineering Manager, Marvel Semiconductor

**Joe Zipperer**

VP Engineering, MOD Systems

**Cliff Zitlaw**

Fellow, Spansion

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Online Registration:  
www.flashmemorysummit.com



August 9-11, 2011  
Santa Clara Convention Center  
Santa Clara, California

Name		Title
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## Demographics *Please check appropriate boxes*

<b>Type of Company</b> <input type="checkbox"/> Flash-related hardware/software supplier <input type="checkbox"/> Integrator/consultancy/distributor <input type="checkbox"/> Developer of flash-based products <input type="checkbox"/> User of flash-based products <input type="checkbox"/> Other _____  <b>Size of company</b> <input type="checkbox"/> 5,000 + <input type="checkbox"/> 100 to 4,999 <input type="checkbox"/> Less than 100	<b>Job Level</b> <input type="checkbox"/> Executive <input type="checkbox"/> Manager <input type="checkbox"/> Staff <input type="checkbox"/> Other _____  <b>Purchasing Authority</b> <input type="checkbox"/> Approve <input type="checkbox"/> Recommend/specify <input type="checkbox"/> None  <b>Primary Job Function</b> <input type="checkbox"/> Corporate management <input type="checkbox"/> Engineering	<input type="checkbox"/> Software/systems development <input type="checkbox"/> Marketing/Sales/PR <input type="checkbox"/> Other _____  <b>Are you an end user?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  <b>Primary Product Interests at This Event</b> <input type="checkbox"/> SSDs <input type="checkbox"/> Hybrid Drives <input type="checkbox"/> Memory Cards <input type="checkbox"/> USB Drives	<input type="checkbox"/> Flash chips <input type="checkbox"/> Flash controllers <input type="checkbox"/> Flash programmers <input type="checkbox"/> Flash-based storage systems <input type="checkbox"/> Design tools <input type="checkbox"/> Connectors <input type="checkbox"/> Software <input type="checkbox"/> Test Equipment  <b>Flash Product Buying Plans</b> <input type="checkbox"/> Plan to buy within a year <input type="checkbox"/> Looking for products on a longer time scale <input type="checkbox"/> Looking for general information
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	<u>Pre-Registration thru 8/3/11</u>	<u>On Site</u>
<input type="checkbox"/> <b>Full Summit: Tuesday, Wednesday and Thursday Best Value!</b> .....	\$ 995 .....	\$ 1495
Includes access to Tues. Forums, Wed tutorials; all reserved and open sessions; roundtable sessions; panel discussions; exhibits; luncheons; receptions; refreshment breaks; conference proceedings; handouts; raffles and prize drawings.		
<input type="checkbox"/> <b>One-Day Technical Program</b> <input type="checkbox"/> <b>Tuesday</b> <input type="checkbox"/> <b>Wednesday</b> .....	495 .....	695
Includes access to all events on the day selected.		
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<b>Monday Events</b> These events incur a separate charge and are not covered by Full-Summit admission.		
<input type="checkbox"/> 9am-5pm Workshop: <b>Flash Security</b> .....	295 .....	495
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