2015 Preview Program

All You Need to Know about Flash in One Place

August 11-13 2015
Santa Clara Convention Center / Santa Clara CA
Register Online www.FlashMemorySummit.com

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The #1 Flash Memory Conference
Featuring Flash in Enterprise Applications

Can Solid State Drives Resolve Your Application Bottlenecks? Find out why SSDs are appearing in data centers everywhere! Flash Memory Summit will show you how your competitors are using SSDs to speed up databases, transactions, data analysis, video and sensor networks, laptops, cloud computing, business intelligence, and more!

New This Year

Pre-Conference Seminars
- Persistent Memory
- Performance Testing
- Containers and Docker
- Flash Storage Networking

Forums
- Flash and Software Defined Storage
- Flash Growth and Opportunity in China
- SSD Concepts • SSD Testing • 3-D Flash
- Hyperscale Applications

Tutorials
- Big Data Applications • Flash Reliability
- Lean Agile Development
- Tiering and Caching

IT End User Sessions
- Getting the Most Out of Your Flash Storage
- Why You Should Use SSDs Everywhere
- End Users Share Insight

New Session Topics
- Applying New Non-Volatile Technologies
- Automotive Applications • Flash Arrays
- Flash Controller LDPC Options
- Flash Technology
- Hybrid vs All-Flash Arrays
- Persistent Memory Applications
- Using Flash with a Massively Scalable Storage System (Ceph)
- Redefining Main Memory Architecture
- Standards-Based PCIe SSDs
- Women in the Storage Industry

Expanded Coverage
- Media and Entertainment Applications
- Controllers • Enterprise Applications
- Enterprise Storage Design
- New Technologies • Testing • Wearables

Full-Day Forums
- NVMe and PCIe SSDs
- Flash-Memory Based Architectures
- Enterprise Applications (2 days)
- Controllers and Flash Technology

Half-Day Forums
- Flash in Data Centers
- Enterprise Storage Design • SSDs • Testing
- Flash and Software-Defined Storage
- Memory Cards • 3-D Flash
- Hyperscale Applications

Solutions You Can Use Today

Speed up systems with PCIe and NVMe flash drives
Develop fast, low-cost controllers
Test SSDs efficiently
Use flash in cloud interfaces
Ensure security in flash systems
Measure and improve flash performance
Maximize system speed with flash on the memory bus
Accelerate popular applications with flash

“Solid state drives will be the biggest change in storage—a total game-changer—and flash will be the dominant type of SSD for the foreseeable future.”

JOE TUCCI, EMC

Summit Highlights
- Flash Technology Roadmaps Plenary
- Beer, Pizza, and Chat with the Experts

Forums
- NVMe • Architectures • Controllers
- Enterprise Storage Design
- SSD Technology
- PCIe SSDs • Hyperscale Applications

Sessions
- Enterprise SSD Buying Trends
- Flash Storage Performance Measurements
- New Technologies • RRAM, MRAM
- Wearables • Life Beyond Flash
- Flash in Hyperscale Applications
- Media and Entertainment Applications

Annual Updates
- Flash Technology
- Enterprise Flash Storage • Interfaces
- New Technologies
**Flash Memory Summit** is now the largest storage industry show with the most high-level keynoters, the largest exhibit hall, and the most sessions covering everything from applications and architectures through enterprise storage, controllers, 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 best practices in the data center. As one attendee put it, “Flash is a big society and FMS is the right show.” If you are involved in the digital storage industry, you won’t want to miss Flash Memory Summit 2015, this summer’s hot technology event!

**Reasons to Attend This Year’s Summit**

**Latest Trends:** You’ll find out exactly what’s happening in flash and SSD-based technologies, flash system architectures, enterprise storage design, new technologies, controllers, and interfaces. Attend update sessions on flash technology, enterprise storage, interfaces, and new technologies.

**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!

**New Topics and Features:** Hear about 3-D flash, flash on the memory bus, persistent memory, and high-performance flash systems. Find out about applications in wearables, Internet-of-Things, media and entertainment, and hyperscale.

**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.

**Exhibiting • Sponsorship**

alan@FlashMemorySummit.com

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**SUMMIT TRACKS**

This year’s Summit includes more program tracks than ever before! From hardware and software design and engineering to testing, marketing, and applications, FMS has you covered.

- Applications Track
- Architecture Track
- Business Track
- Controllers Track
- Data Management Track
- Embedded Systems Track
- Enterprise Applications Track
- Enterprise Storage Track
- Flash Technology Track
- Hardware Track
- Hyperscale Applications Track
- IT End User Track
- Marketing Track
- Media and Entertainment Track
- New Technologies Track
- PCIe Storage Track
- Security Track
- Software Track
- SSDs Track
- Standards Track
- System Development Track
- Testing Track
- Wearables Track

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**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!

- Most Innovative Consumer Application
- Most Innovative Business Application
- Most Innovative Technology
- Most Innovative Consumer Implementation

Entry forms, deadlines and contest rules are available online:

www.FlashMemorySummit.com

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**FMS Theatre**

Get the latest product scoops at FMS Theatre!

*Open during exhibit 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. Unfortunately, we do not have room for large dance numbers, brass bands, or circus animals!

For details contact:

alan@flashmemorysummit.com

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Chairperson’s Message

Flash memory is achieving widespread adoption in every industry and for many applications. Flash memory is now a staple for enterprise applications ranging from database searches and big data analytics through transaction processing and even archiving. Flash memory powers our mobile devices and is a critical component in the cloud storage systems that support those devices. Non-volatile flash memory is driving new storage system architectures and storage interface technologies.

At the 2015 Flash Memory Summit, you can find out about the latest developments in flash memory technology and its applications. You will learn about advances in solid-state storage, hear case studies, discover new features and capabilities, and understand the current state of the industry. End users in particular will find out how to best use flash memory to improve their organization’s bottom line.

The 2015 FMS will be bigger than ever. Our program covers every aspect of flash and other non-volatile memory, including end user experiences and best practices, informative tutorials, enterprise storage applications, client applications, storage architectures, controllers, standards, security, user applications, virtualization, testing, embedded systems, PCIe storage, data recovery and data management issues.

Our exhibit area will feature the leaders in flash memory, digital storage, test and evaluation equipment and services as well as important industry groups. Startups and established companies will be meeting with potential customers and partners at their booths. The Exhibit Theatre will feature talks about the latest products. The Flash Memory Awards will continue to honor outstanding companies and products.

Regardless of how you are involved in the digital storage industry, the 2015 Flash Memory Summit has something for everyone. This is one storage event that you won’t want to miss.

Tom Coughlin
Conference Chairperson
President, Coughlin Associates

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- MP STOR
- UNFLY
- SAGE
- Virtium

Innovation Leader Awards

Innovation Leader Awards as voted by IT Pros

Innovation Leader Awards, selected by IT pros in 14 different product categories, and three special achievement awards will be recognized this year in two separate presentations on Wednesday, August 12.

2015 Special Achievement Awards: Contributions to SSD Innovation
Wednesday 11:30 am • Mission City Ballroom

2015 SSD Innovation Leader Awards
Wednesday 5:30 pm • Exhibit Hall Booth 325

Covering a wide range of products including networking, servers, and storage, IT Brand Pulse Leader Awards measure the perceptions of IT professionals in large enterprise, medium enterprise and HPC environments. Storage award categories are:

- All Flash NAS SSD Systems
- All Flash Fibre Channel SSD Systems
- All Flash Unified SSD System
- All Flash System Management Software
- All Flash iSCSI SSD Systems
- All Flash InfiniBand SSD System
- Flash Cache Software
- Virtual Server Cache Software
- Hybrid HDD/SSD Systems
- Memory Channel Storage
- PCIe SSD DAS Adapters
- PCIe SSD SAN Adapters
- SAS/SATA SSD Modules
- SSD Controller Chips

“These awards reflect the judgment of major customers and key IT personnel at important data centers. They are the only awards based on the experience of those who actually buy and use the products,” said Lance Leventhal, FMS Program Chairperson. “Receiving an IT Brand Pulse award shows that a company is doing the job where it really counts—in the field!”

2015 Flash Memory Summit and Exhibition
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Keynote Presentations

Keynote 1: Driving Intelligence for Safe Automobiles
Tuesday 11:00 - 11:30 am
Hideo Inoue, GM, Advanced Vehicle Research, Toyota

Japan faces a rapidly aging society. Two collaborative projects in intelligent vehicle research and development are currently underway to meet the associated challenges. The first is developing an intelligent driving system to achieve a safe, secure traffic society for elderly drivers. The second, the Smart Traffic Flow Control Project, is developing an advanced driver assistance system that can both enhance safe, secure driving and reduce congestion. Flash memory plays a key role in achieving the goals of safety, security, and improved traffic flow.

Prior to his current position at Toyota, Hideo Inoue was GM of the R&D Management Division and of the Integrated System Engineering Division. He has developed vehicle control technologies such as active safety systems, and has helped promote them in the marketplace. He has also worked on development of driver assistance, integrated safety, energy management, and intelligent transportation systems. Mr. Inoue serves as a part-time lecturer at Kyushu University and a Guest Professor at the Tokyo University of Agriculture and Technology.

Keynote 2: Flash Solves Big-Time Performance Problems in Today’s Data Centers
Tuesday 11:30 am - Noon
Mike Workman, SVP, Flash Solutions, Oracle

Keynote 3: Memory Technology Advances Shape a New Era in Flash Innovation
Tuesday Noon - 12:30 pm
Jim Elliott, Corporate Vice President, Samsung Semiconductor
Bob Brennan, SVP, Memory Solutions Lab, Samsung Semiconductor

Semiconductor memory technology will advance tremendously over the next several years. The storage industry will benefit from better ways of designing flash memory chips, with greater stacking efficiency, reduced power consumption, and increased performance. There will also be bold efforts to harness NAND’s full potential, including the promise of adding storage intelligence to perform workload management. Solid state storage (SSDs), especially with 3D V-NAND, will mushroom in importance, achieving much higher bandwidth in such applications as all-flash arrays. Advances in memory technology will thus play a major role in achieving critical goals such as instant access, massive amounts of flash-based storage, instant connectivity, and instant relevance. So too, flash-optimized data centers will be able to much better support big data, real-time analysis, and the Internet of Things.

Jim Elliott oversees product marketing activities for Samsung’s memory organization in the Americas, and US marketing communications activities for Samsung Semiconductor. He has 18 years’ experience in the semiconductor industry, focused on product sales and marketing at major multinational companies. With Samsung for the past 12 years, he has held leadership positions in both marketing and sales. Elliott holds a BA from the University of California at Davis and an MBA from Cal Poly San Luis Obispo.

Bob Brennan leads Samsung’s Memory Solutions Lab (MSL), which is chartered with creating system and platform architectures aligned with the growth of Samsung’s memory business. MSL also develops and enables world-class products such as NVMe and PCIe flash drives. Before joining Samsung, Bob was the Lead Architect of Intel’s Datacenter System on Chip products, with his most recent focus being on Intel’s storage and microserver products. Bob holds a BSEE from Duke University and an MSEE from the University of Virginia.

Keynote 4: TBD
Tuesday 1:30 - 2:00 pm
Kevin Conley, CTO, SanDisk

Keynote 5: Advances in 3D Memory—High Density Storage for Hyperscale, Cloud Applications, and Beyond
Tuesday 2:00 - 2:30 pm
Shigeo (Jeff) Oshim a, Technology Executive, Memory Design and Application Engineering, Semiconductor and Storage Products Company, Toshiba

NAND flash storage is being deployed more widely as it delivers cost/performance benefits in hyperscale and cloud applications. Ever higher densities are necessary to provide more cost effective solutions and to meet rapidly increasing demand for storage. However, floating gate technology is reaching the limits of its scalability. The key to supporting higher densities for the storage market is a 48-layer 3D solution that will enable a smooth migration to 3D technology. High performance, lower power, increased efficiency, and scalability are essential to making competitive 3D memory-based storage solutions a practical reality.

Jeff Oshim a is a member of the Semiconductor and Storage Products executive team at Toshiba, where he focuses on memory design and applications engineering. He was previously VP of Memory Technology at Toshiba America Electronic Components, focused on flash memory with an emphasis on SSDs. He has also been Senior Manager of R&D in the advanced NAND flash memory design department. Mr. Oshim a has worked on memory at Toshiba for over 30 years, including 20 years on DRAM where he acted as a lead designer for application-specific memories. He has served as a Visiting Research Scientist at Stanford University. He holds a BSEE and MSEE from Tokyo’s Keio University.

continued
**Keynote Presentations continued**

**Keynote 6: Disruptive Memory Technology Enables New In-Memory Applications**

**Tuesday 2:30 - 3:00 pm**

**Riccardo Badalone, CEO and Co-Founder, Diablo Technologies**

Applications are evolving to harness the potential of in-memory compute. Storage-centric architectures simply cannot keep pace with the demanding performance required by real-time analysis and large-scale big data processing. A groundbreaking new memory solution will enable economical, real-time processing of many terabytes of data in a single server. As a result, storage and networking bottlenecks are eliminated, providing dramatic improvements in performance and extending in-memory compute to innovative new use cases.

Riccardo Badalone is a Co-Founder of Diablo Technologies and has been CEO since 2007 and was previously the CTO. Before co-founding Diablo, Riccardo worked for Nortel Networks, where he was pivotal in delivering advanced Serializer/Deserializer (SerDes) technologies for switching and framer applications. Riccardo has also been manager of the OEM Hardware design group at Matrox Graphics, where his team designed and supported desktop motherboard platforms for major PC OEMs. Riccardo holds a BSEE from Concordia University (Montreal, Quebec, Canada).

**Keynote 7: How NAND Flash and Future NVM Technologies will Revolutionize Computing**

**Wednesday 11:00 - 11:30 am**

**Kyo Won Jin, SVP, NAND Product Strategy and Solutions, SK Hynix**

NAND flash will keep on revolutionizing computing and applications for the near future. NAND flash, particularly its 3D version, will provide higher densities, lower prices, and much better performance for the next several years. Persistent memory and all-flash arrays will keep finding new users and new applications. The revolution in computing and applications will continue with greater emphasis on in-memory computing and intelligent storage.

Kyo Won Jin is responsible for all NAND development activities from product planning through development and productization at SK Hynix. He previously oversaw the DRAM Product Development Group and NAND Product Planning Office. With 30 years of experience in DRAM and NAND design, product planning, and productization, Kyo Won has played a major role in SK Hynix’s turnaround, helping the company become a global leader. He also served as the Head of the Semiconductor Planning Office at SK Telecom (Korea) for two years where he acquired broad knowledge of business development in the telecom industry. In recognition of his contributions to the semiconductor industry, Mr. Jin was awarded the Presidential Citation of the Republic of Korea. He holds a BS in physics from Seoul National University.

**Keynote 8: When Will Flash Dominate Storage?**

**Wednesday 11:40 am - 12:10 pm**

**Darren Thomas, VP/GM, Storage Business Unit, Micron**

Everyone agrees that flash is the logical choice for primary storage. So why, even though flash has been around for a long time, is it still only 5% of total storage deployments worldwide? Will new semiconductor processes be sufficient to close the price gap with hard drives? When will the crossover occur? What role does software, especially tiering and data management stacks, play? How will 3D NAND affect the consumption and deployment of flash storage? Can flash storage move even further afield, such as into the cold data and deep archive spaces?

Darren Thomas oversees Micron’s solid state storage business that ranges from hard disk drive replacements with solid state drives to enterprise-class storage solutions. He was previously VP/GM Storage at Dell, where he transformed the company from providing strictly OEM solutions to having its own distinct strategy and product lines. He has also been VP/GM Storage at Compaq Com-

**Keynote 9: Flash and Hard Drives—A Winning Combination for Future Data Centers**

**Wednesday 2:00 - 2:30 pm**

**Phil Brace, EVP, Electronic Solutions, Cloud Systems and Solutions, Seagate Technology**

Big data, real-time analytics, video and image processing, mobile access everywhere, and the Internet of Things are all leading to needs for more storage and faster access. Costs must be reasonable and legacy applications must be preserved. Future storage systems must combine flash memory and hard drives in an efficient, cost-sensitive manner. The industry must find ways to ensure that enterprises and other users get the most out of the storage they have and the most return for their dollars. The methods used to achieve this must be easy to implement and administer, fully scalable, and flexible enough to meet demands we cannot yet even imagine.

Phil Brace is interim president for Seagate’s Cloud Systems and Solutions and Electronic Solutions organizations, with responsibility for enterprise storage systems and services at Seagate. Brace brings over 20 years of experience to his current role. Earlier, he headed Seagate’s Electronics Solutions organization. Before joining Seagate, he spent nine years at LSI in senior technology and business leadership roles. He also worked at Intel, where he served as GM of Server Platforms Group Marketing. Brace received his MSEE from California State University, Sacramento and his Bachelor’s degree in Computer Engineering from the University of Waterloo, Canada.
Keynote Presentations continued

Keynote 10: Breaking Down the Barriers to PCIe SSD Adoption
Wednesday 2:30 - 3:00 pm
Derek Dicker, VP, NVM Solutions, PMC

Data centers are incorporating SSDs into their storage tiers to significantly improve data access times and CPU efficiency. Last year, the emergence of the new NVMe standard, merchant PCIe flash controllers, and Software Defined Flash (“managing the flash via software rather than it being fixed in hardware”) together led to the arrival of the first standardized PCIe SSDs in the enterprise market. The new drives offer much lower latency and an order of magnitude higher performance than SATA SSDs, and can be optimized for specific workloads, as well. Technical advances have enabled a new level of performance, capacity, customization and now, scalability. New infrastructure products solve the challenges of scale-out NVMe flash storage. When combined with a second-generation Software Defined Flash platform, such developments are breaking down the barriers to PCIe SSD adoption.

Derek Dicker is responsible for market definition, global research and development, all product roadmap and lifecycle planning, and program management for PMC’s Enterprise SSD Controller Products and Solutions Group. He was instrumental in creating and developing PMC’s NVM Solutions Group and in directing it to produce the industry’s first PCIe NVMe controller. Derek joined PMC in 2010 as Vice President, Enterprise Storage Division Marketing. Before that, he was VP/GM for IDT’s Networking Division. Derek began his career at Intel, moving up to director-level positions in marketing and program management, as well as being Technical Assistant to the Executive VP/GM of the Communications Group. He earned his BS in Computer Science and Engineering from UCLA and graduated from the Stanford Business School’s Executive Program.

Keynote 11: TBD
Thursday 11:05 - 11:35 am
Val Bercovici, Cloud Czar, NetApp

Keynote 12: All-Flash Arrays Require Scalable, Cost-Efficient Software-Defined Architectures
Thursday 11:35 am - 12:05 pm
Shachar Fienblit, CTO, Kaminario

All-flash arrays are obviously a huge success in data centers. They offer much higher performance and lower TCO than HDD-based storage. But what kind of arrays will meet the challenges of big data, real-time analytics, mobile access everywhere, and the Internet-of-Things? Which will adapt better to rapid advances in flash technology? Architectures must be software-defined to meet new requirements and provide the flexibility that enterprises, clouds and hyperscale data centers demand. They must also scale-out and scale-up to allow cost efficient expansion without massive infrastructure or software changes, thus meeting data center requirements. Designers cannot predict the future, but they can provide the flexible, cost-efficient, agile architectures data centers will surely need.

As CTO of Kaminario, a leading developer of flash storage arrays for enterprise applications, Shachar Fienblit is responsible for research, development and the strategic roadmap for future growth. His major expertise is in real-time software development, architecture, performance optimization, and large-scale team management for storage products. Before becoming CTO, Shachar was Kaminario’s VP of Engineering and was responsible for developing Kaminario’s industry-leading K2 all-flash array. Before joining Kaminario, he was a Storage Development Architect in IBM’s Haifa Laboratory, where he was responsible for the architecture, definition, design, and development of enterprise storage products. He was the architect of advanced copy functions for IBM’s backup, replication, and business continuity systems. Mr. Fienblit holds a BSc in computer science from Haifa University, Israel.

Keynote 13: TBD
Thursday 2:00 - 2:30 pm
Narayan Venkat, CMO, Tegile

Keynote 14: TBD
Thursday 2:30 - 3:00 pm
Shaun Walsh, VP Corporate Marketing, QLogic

“Flash Memory Summit is the most important global gathering for those involved in flash memory.”

NATIONAL CHIAO TUNG UNIVERSITY PRESS RELEASE

Register Now

Register by 8/6 for Online Pricing
PCIE STORAGE TRACK
Forum A-11: NVMe and PCIe SSDs, Part 1
- NVMe: State of the Union
- NVMe Management Interface
- NVMe and Security
- NVMe Over Fabrics
Forum A-12: NVMe and PCIe SSDs, Part 2
- NVMe Ecosystem Development
- NVMe in Mobile Platforms
- End User Testimonial
- Closing Summary and Future Directions

ARCHITECTURES TRACK
Forum B-11: Flash Memory Based Architectures: A Technical Discussion, Part 1
- How Good Is Your Memory: An Architect’s Look at SSDs
- Anatomy of a High-Performance, Hierarchical FTL Architecture
- Standardizing Storage Intelligence in SSDs
- Cooperative Flash Management: A Scalable Architecture
Forum B-12: Flash Memory Based Architectures: A Technical Discussion, Part 2
- Addressing Flash Reliability with LDPC
- Active Flash Management Based on Machine Learning
- A Low-Cost Architecture for an All-Flash Array
- A Power-Efficient Fabric Using a Shared Flash Translation Layer

SSDS TRACK
Forum C-11: Enterprise SSDs
- Ultra High Capacity SSD Storage
- Why SSDs Are Emerging Rapidly in Data Centers
- Whack-a-Mole Game of High Performance SSD Design
- High Performance and High Reliable SSD
- Using SSDs Without External DRAM
- When Will SSDs Replace HDDs?
Forum C-12: SSD Technology
- Middleware and Flash Translation Layer Co-Design for Boosting SSD Performance
- Optimizing Hybrid SSD Performance by Dynamical Partitioning
- Interest in PCIe SSDs Expecting to Soar with Next CPU Chipset
- Why DRAM Really Matters Inside SSDs
- Maximize Efficiency and Endurance of Solid State Drives
Forum C-31: SSD Concepts
- Choosing the Right SSD for a Boot Application
- I/O Virtualization in Enterprise SSDs
- An Adaptive Flash Platform
- A Software Layer That Makes Low-Cost SSDs Suitable for Enterprise Use
- Server-Side Flash and Application Integration
- All Flash Enterprise Storage Drives Different NAND Requirements

ENTERPRISE STORAGE TRACK
Forum D-11: Flash in Data Centers
- Why NVMe Will Replace SATA SSDs in the Data Center
- Improved Solutions for I/O Provisioning and Application Acceleration
- Best Practices for Optimizing Data Center Object Storage Using NVMe
- Empowering Low-Latency Flash-Optimized NoSQL Databases
- SAS’s Role in the Future Data Center
- Customer Insight on Flash in the Data Center
- Virtualization Software for Flash and NVDIMM
Forum D-12: Enterprise Storage Design, Part 1
- Flash Goes Mainstream
- iSCSI Extensions over RDMA (iSER): A New High-Speed Storage Protocol for Flash Memory
- Flash as the Next-Generation Primary Storage Platform
- Data Encryption in a Flash World
- Holistic Flash Management for Next-Generation All-Flash Arrays
- In-Storage Processing Using Software Defined Storage Devices
Forum D-21: Enterprise Storage Design, Part 2
- High-Performance, Highly Scalable Storage Architecture Using NVMe
- Building a Flash Optimized Storage System
- SSDs to the Rescue in a World of Big Data
- Using Flash in Workload-Aware Storage
Forum D-22: Flash and Software-Defined Storage
- File on Flash: Delivering on the Promise of Webscale, All Flash, File Systems
- Building All-Flash Software Defined Storage for Datacenters
- How NVRAM Improves Software Defined Storage Solutions
- Leveraging Software Defined Storage with a Full Hardware NVMM Express Solution
- At-Scale Data Centers and the Demand for New Storage Architecture

MEDIA AND ENTERTAINMENT TRACK
Session 101-B: Flash in Studio/Broadcast Production/Post Storage
- The Death of Film
- Handling Massive Scale Visual Effects Head On
Session 102-B: Flash in Content Capture
- What It Takes for Capture to Stick
- The Way We Work
- Capture All You Want—If You Can’t Find It, What Good Is It?
- Taking Films to New Heights
Session 103-B: Flash in the New Hollywood
- Understanding 4K Adoption and Technologies
- Being There When It’s Needed
- Bringing Creativity to Life
- Our Budget Is More Than Money

DATA MANAGEMENT TRACK
Session 103-D: Flash in Big Data Applications
- Smart Cache Management for Big Data
- Using Flash in In-Memory Database Appliances
- Developing a Flash-Optimized Storage Engine for a NoSQL Database

CONTROLLERS TRACK
Forum E-21: Controllers and Flash Technology, Part 1—Hardware and Algorithms
- Safely Overclocking Flash I/O in SSDs
- Read Disturb Errors in MLC NAND Flash Technology
- Extending NAND Endurance with Advanced Controller Technology
- DSP for Signal Fidelity on ONFI4 Bus
- Controller Concepts and Results for 1y/12nm and 3D NAND Flash
- Does Soft-Decision ECC Improve Endurance?
Forum E-22: Controllers and Flash Technology, Part 2—Decoding the Future
- New ECC/DSP Solutions Aids Migration to 3D NAND Era
- High-Radix LDPC—A Silicon Saving Approach
- Hardware Architectures for Novel Low-Power Low Error-Floor
- How LDPC is Enabling New NAND Flash Memories
- VLSI Architectures for Non-Binary LDPC Decoder
- Read Disturb Characterization for Next-Generation Storage Applications
Forum E-31: Flash Controller Design Options
- Building a Controller That Can Handle Any Type of Flash
- An Instruction-Based NAND Flash Processor Unit (NPU)
- How to Extend 2D-TLC Endurance to 3000 P/E Cycles
- Reliability Factors in Next Generation NAND Flash Devices
- Data Retention in MLC NAND Flash Memory
- Platform on a Chip (PoC) Solution to Storage Management
- High Reliability SSDs for Enterprise Storage w/Dynamic VTH Optimization

TESTING TRACK
Forum F-21: SSD Testing
- SSD Explorer: A Virtual Platform for SSD Simulation
- True Cost-of-Test for SSD High Volume Manufacturing and Large Scale Quality Organizations
- Innovative Approach to Improved Reliability Demonstration Testing
- Radiation Effects in SSDs
- Test Architecture for Power Cycling Storage Devices
- How Fast is Fast—Block IO Performance on a RAM Disk
Forums and Sessions  continued  Partial list • for more information visit FlashMemorySummit.com

APPLICATIONS TRACK
Session 101-C: Mobile Applications
• UFS is Ready to Power Next-Generation Mobile Devices
• New Programming Technology for High Density eMMC
• UFS Presents Biggest Opportunity for TLC Flash
• Using PCIe/NVMe in Mobile Devices

Session 102-C: Consumer Applications
• The Evolution of SSD Form Factor in Consumer Applications
• The Next Wave of Accelerated SSD Adoption for Consumer PCs
• Why Your PC Should Have an SSD

ENTERPRISE APPLICATIONS TRACK
Forum G-11: Enterprise Applications, Part 1
• Leveraging an All-Flash Array in Creating a Private Cloud
• All Flash Arrays in the Heath Care Data Center
• Database Array NVMe Flash: Pushing Application Performance
• To Flash or Not to Flash Isn’t the Question—How to Flash is the Question
• Redefining Flash Economics for Enterprise Storage and Hyperconvergence
• Flash: More than Tier 0 Storage

Forum G-12: Enterprise Applications, Part 2
• Building the Next Generation Data Center Today
• Flash Storage Use Cases—Customers Share Their Views
• Why Upgrade Infrastructure to Hyperconverged
• When Will SSDs Replace HDDs?
• Why SSDs Are Emerging Rapidly in Data Centers
• Applying SSDs to Tiered Storage

PCIE STORAGE TRACK
Forum J-31: PCIe/NVMe Storage
• Modeling a High-Performance NVMe Express SSD constructed from ReRAM
• Extending PCIe/NVMe Storage to Client
• Make the Good Even Better with NVMe
• An FPGA based NVMe SSD Platform
• PCIe NVMe SSD BIOS/Firmware and Drivers

SOFTWARE TRACK
Forum K-22: Creating Software Optimized for Flash Memory
• Linux Kernel Extensions for Open-Channel SSDs
• Scale-Out Storage Architectures in the NVM Era
• A New File System Design Specifically to Take Advantage of Nonvolatile Memory
• How the NVM Programming Model Eases the Software Challenge
• How Systems Benefit from Record Low Storage Latencies

MEMORY CARDS TRACK
Forum L-31: Adding Low-Cost Storage to Mobile Applications with SD Memory Cards
• Protecting Data Centers from Mobile Threats
• Increasing Mobile Storage Bandwidth
• Increasing Video Recording Speed
• SD Card Performance In-Depth Analysis

NEW TECHNOLOGIES TRACK
Forum M-12: 3-D Flash
• 3D NAND Costs and Transition Timeline
• Comparison of /1x nm 2D Planar and 3D V-NAND Architecture
• 3D RRAM with Ultra-Thin Switching Layer
• 3D NAND Has Arrived!
• 3D TLC is the New MLC for NAND
• 3D NAND Technology - Implications for Enterprise Storage Applications

Session 102-A: 3D Flash—The Next Dimension
• New ECC/DSP Solutions Aids Migration to 3D NAND
• How Will 3D SSDs Differ from Current Ones?
• Coding Schemes for 3D NAND Flash

Session 202-A: Flash on the Memory Bus
• NV-DMIMM Integration and Backup Power Scaling
• NV-DMIMM Applications
• Flash in the Memory Channel: Enabling Truly Converged Memory
• NVDIMMs: Setting a New Memory Standard for Supercharging Datacenter Performance

Session 203-A: RRAM
• ReRAM is Making Good Progress
• Versatile RRAM Technology and Applications
• ReRAM Technology Perspective

Session 301-C: Life Beyond Flash—New Non-Volatile Memory Technologies
• A Scalable Next-Generation NOR-type Flash Memory
• Alternative Non-Volatile Memory Adoption Timeline
• NVRAM Emulation Platform and Persistent Heap

Session 302-D: Persistent Memory Applications
• Using Flash in the Memory Channel to Migrate Database Applications
• Powering Next-Generation Backup Memory for NVDiMMs

Session 303-B: Automotive Applications of Flash
• Evolving In-Vehicle Storage Solutions for Personal Mobility
• Adding Mass Storage to Mobile Automotive and Industrial Applications
• Flash Storage at the Edge in the Automotive Industry
• Embedded Flash—Driving Down the Automotive Memory Lane

Session 304-B: Flash and the Internet of Things
• Flash Memory for the Internet of Things (IoT)
• IoT: Hackers, Attack Anatomy, and Security Trends
• Embedded Flash Storage Solution for IoT

BUSINESS TRACK
Forum N-11: Flash Growth and Opportunity in China
• Alibaba Ecosystem and Infrastructure
• Big Data Applications for County Level Cities in China
• All-Flash Array Developed in a Chinese University
• Observations on the Chinese Flash Memory Market
• Using Flash in Archival Storage
• Big Data for Human Learning and Privacy Protection

HYPERSCALE APPLICATIONS TRACK
Forum P-22: Flash in Hyperscale Applications
• Impact of NVMe on Servers in Megawebsites
• Best Practices for Using Flash in Hyperscale Software Storage Architectures
• How Client SSD Controller Fits the Bill in Hyperscale Applications
• Flash Use Cases: Traditional Infrastructure vs. Hyperscale
• The Hyperscale Challenge: Flash Deployed in a Disaggregated Model

WEARABLES TRACK
Session 201-E: Flash When Wearables Come to Work
• How CIOs See Wearables in Tomorrow’s Business

Register Now
Register by 8/6 for Online Pricing
Schedule • Monday / Tuesday  

**Monday**

Pre-Conference Day  
8:00 am – 5:00 pm  
Registration  
8:30 am – Noon  

**PRE-CONFERENCE SEMINAR A**  
Making Error Correcting Codes Work for Flash Memory  

**PRE-CONFERENCE SEMINAR B**  
Introduction to PCI Express  

**PRE-CONFERENCE SEMINAR C**  
Introduction to SSDs  

**PRE-CONFERENCE SEMINAR D**  
Using Persistent Memory to Increase Performance  

**PRE-CONFERENCE SEMINAR E**  
Flash Storage Networking  

9:30 – 10:15 am  
SNIA Seminar 1: The Case for Flash Storage—How it Can Benefit Your Enterprise OPEN  

10:20 – 11:05 am  
SNIA Seminar 2: Separate vs Combined Server Clusters for app Workloads and Shared Storage OPEN  

11:10 – 11:55 am  
SNIA Seminar 3: Object Drives—A New Architectural Partitioning OPEN  

Noon – 1:00 pm  
Lunch  

1:00 – 5:00 pm  

**PRE-CONFERENCE SEMINAR F**  
Introduction to 3D Flash  

**PRE-CONFERENCE SEMINAR G**  
Introduction to NVM Express (NVMe)  

**PRE-CONFERENCE SEMINAR H**  
Deploying Flash in the Data Center  

**PRE-CONFERENCE SEMINAR I**  
Make Testing Work for You  

**PRE-CONFERENCE SEMINAR J**  
Containers and Docker  

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**Tuesday**

8:00 – 8:30 am  
Continental Breakfast  

8:00 am – 7:00 pm  
Registration  

8:30 – 9:35 am  
**TESTING TRACK**  
Session 101-A: Performance Testing  

**MEDIA AND ENTERTAINMENT TRACK**  
Session 101-B: Flash in Studio/Broadcast Production/Post Storage  

**APPLICATIONS TRACK**  
Session 101-C: Mobile Applications OPEN  

**ARCHITECTURES TRACK**  
Session 101-D: Redefining Main Memory Architecture to Save Cost and Power OPEN  

**HARDWARE TRACK**  
Session U-1: Annual Update on Flash Technology  

8:30 – 10:50 am  
**PCIE STORAGE TRACK**  
Forum A-11: NVMe and PCIe SSDs, Part 1  

**ARCHITECTURES TRACK**  
Forum B-11: Flash-Memory Based Architectures: A Technical Discussion, Part 1  

11:00 – 11:30 am  
**Keynote 1:** Driving Intelligence for Safe Automobiles OPEN  
Hideo Inoue, GM, Advanced Vehicle Research, Toyota  

11:30 am – Noon  
**Keynote 2:** Flash Solves Big-Time Performance Problems in Today’s Data Centers OPEN  
Mike Workman, SVP Flash Storage Systems, Oracle  

Noon – 12:30 pm  
**Keynote 3:** Memory Technology Advances Shape a New Era in Flash Innovation OPEN  
Jim Elliott, Corporate VP; and Bob Brennan, SVP, Memory Solutions Lab; Samsung Semiconductor  

12:30 – 1:30 pm  
Lunch  

Lunch and Learn with Bold Echo Communications OPEN  

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**SSDS TRACK**  
Forum C-11: Enterprise SSDs  

**ENTERPRISE STORAGE TRACK**  
Forum D-11: Flash in Data Centers  

**ENTERPRISE APPLICATIONS TRACK**  
Forum G-11: Enterprise Applications, Part 1 OPEN  

**BUSINESS TRACK**  
Forum N-11: Flash Growth and Opportunity in China OPEN  

**MEDIA AND ENTERTAINMENT TRACK**  
Session 102-A: 3D Flash—The Next Dimension  

**APPLICATIONS TRACK**  
Session 102-C: Consumer Applications OPEN  

**CONTROLLERS TRACK**  
Session 102-D: FPGAs in Flash Controller Applications  

**ENTERPRISE STORAGE TRACK**  
Session U-2: Annual Update on Enterprise Flash Storage  

9:45 – 10:50 am  
**Keynote 1:** Driving Intelligence for Safe Automobiles OPEN  
Hideo Inoue, GM, Advanced Vehicle Research, Toyota  

11:00 – 11:30 am  
**Keynote 2:** Flash Solves Big-Time Performance Problems in Today’s Data Centers OPEN  
Mike Workman, SVP Flash Storage Systems, Oracle  

11:30 am – Noon  
**Keynote 3:** Memory Technology Advances Shape a New Era in Flash Innovation OPEN  
Jim Elliott, Corporate VP; and Bob Brennan, SVP, Memory Solutions Lab; Samsung Semiconductor  

12:30 – 1:30 pm  
Lunch  

Lunch and Learn with Bold Echo Communications OPEN  

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

1:30 - 2:00 pm  
**Keynote 4**: TBD  OPEN  
Kevin Conley, CTO, SanDisk

2:00 - 2:30 pm  
**Keynote 5**: Advances in 3D Memory—High Density Storage for Hyperscale, Cloud Applications, and Beyond  OPEN  
Shigeo (Jeff) Ohshima, Technology Executive, Memory Design and Application Engineering, Semiconductor and Storage Products Company, Toshiba

2:30 - 3:00 pm  
**Keynote 6**: Disruptive Memory Technology Enables New In-Memory Applications  OPEN  
Riccardo Badalone, CEO and Co-Founder, Diablo

3:15 - 4:25 pm  
**SECURITY TRACK**  
Session 103-A: Storage Security—Back to the Future

**MEDIA AND ENTERTAINMENT TRACK**  
Session 103-B: Flash in the New Hollywood  OPEN

**MARKETING TRACK**  
Session 103-C: Enterprise SSDs—Who’s Adopting Them and Why?  OPEN

**DATA MANAGEMENT TRACK**  
Session 103-D: Flash in Big Data Applications

3:15 - 5:45 pm  
**HARDWARE TRACK**  
Session U-3: Annual Update on Interfaces

**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 2  OPEN

**NEW TECHNOLOGIES TRACK**  
Forum M-12: 3-D Flash

4:35 - 5:50 pm  
**SECURITY TRACK**  
Session 104-A: Security in a Flash!

**MEDIA AND ENTERTAINMENT TRACK**  
Session 104-B: Media and Entertainment Experts Roundtable  OPEN

**MARKETING TRACK**  
Session 104-C: How Flash-Based Storage Performs on Real Applications  OPEN

**FLASH TECHNOLOGY TRACK**  
Session 104-D: Flash Technology, Part 1

**NEW TECHNOLOGIES TRACK**  
Session U-4: Annual Update on New Technologies

6:00 - 7:00 pm  
Plenary: TBD

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

sponsored by Cadence Systems

Wednesday

8:00 - 8:30 am  
Continental Breakfast

8:00 am - 7:00 pm  
Registration

8:30 - 9:35 am  
**DATA MANAGEMENT TRACK**  
Session 201-A: Data Recovery of SSDs

**PCIE STORAGE TRACK**  
Session 201-B: Standards-Based PCIe SSDs Are Game Changers—What Designers Need to Know  OPEN

**PCIE STORAGE TRACK**  
Session 201-C: PCIe/NVMe Development issues

**ENTERPRISE STORAGE TRACK**  
Session 201-D: Flash Arrays, Part 1  OPEN

**WEARABLES TRACK**  
Session 201-E: Flash When Wearables Come to Work  OPEN

**MARKETING TRACK**  
Session 201-F: Hybrid vs All Flash Arrays—Which is Better for Your Data Center?  OPEN

**DATA MANAGEMENT TRACK**  
Tutorial T1: Increasing Flash Throughput for Big Data Applications

continued
Schedule continued • Wednesday

8:30 - 10:50 am

ENTERPRISE STORAGE TRACK
Forum D-21: Enterprise Storage Design, Part 2

CONTROLLERS TRACK
Forum E-21: Controllers and Flash Technology, Part 1—Hardware and Algorithms

TESTING TRACK
Forum F-21: SSD Testing

ENTERPRISE APPLICATIONS TRACK
Forum G-21: Enterprise Applications, Part 3

9:45 - 10:50 am

NEW TECHNOLOGIES TRACK
Session 202-A: Flash on the Memory Bus
OPEN

STANDARDS TRACK
Session 202-B: Choosing the Best Interface for Your Application
OPEN

MARKETING TRACK
Session 202-C: VC Forum
OPEN

Session 202-D: Women in the Storage Industry
OPEN

WEARABLES TRACK
Session 202-E: Flash in Wearable Applications—10,000 Ways to Wear Technology
OPEN

ENTERPRISE STORAGE TRACK
Session 202-F: High-Performance Flash Systems
OPEN

TESTING TRACK
Tutorial T2: Practical Approach to Determining SSD Reliability

11:00 - 11:30 am

Keynote 7: How NAND flash and Future NVM Technologies Will Revolutionize Computing
OPEN

Kyo Won Jin, SVP, NAND Product Strategy and Solutions, SK Hynix

11:30 - 12:10 pm

Keynote 8: When Will Flash Dominate Storage?
OPEN

Darren Thomas, VP/GM, Storage Business Unit, Micron

12:10 - 12:30 pm

Lunch

2:00 - 2:30 pm

Keynote 9: Flash and Hard Drives—a Winning Combination for Future Data Centers
OPEN

Phil Brace, EVP, Electronic Solutions, Cloud Systems and Solutions, Seagate Technology

3:10 - 4:15 pm

NEW TECHNOLOGIES TRACK
Session 203-A: RRAM
OPEN

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

MARKETING TRACK
Session 203-D: Flash Storage Outlook (Storage Wars)
OPEN

WEARABLES TRACK
Session 203-E: Wearable Technology and Health Monitoring
OPEN

IT END USER TRACK
Session EU-1: Getting the Most Value Out of Your Flash Storage
OPEN

Tutorial T3: Lean Agile Development for Solid State Storage

3:10 - 5:45 pm

ENTERPRISE STORAGE TRACK
Forum D-22: Flash and Software-Defined Storage
OPEN

CONTROLLERS TRACK
Forum E-22: Controllers and Flash Technology, Part 2—Decoding the Future

ENTERPRISE APPLICATIONS TRACK
Forum G-22: Enterprise Applications, Part 4

SOFTWARE TRACK
Forum K-22: Creating Software Optimized for Flash Memory
OPEN

HYPERSCALE APPLICATIONS TRACK
Forum P-22: Flash in Hyperscale Applications

4:30 - 5:45 pm

NEW TECHNOLOGIES TRACK
Session 204-A: MRAM
OPEN

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

ENTERPRISE STORAGE TRACK
Session 204-D: Flash in Cloud Computing
OPEN

WEARABLES TRACK
Session 204-E: Wearables Roundtable
OPEN

IT END USER TRACK
Session EU-2: Why You Should Use Flash Everywhere in the Data Center
OPEN

ENTERPRISE STORAGE TRACK
Tutorial T-4: Tiering and Caching in Flash-Based Storage

5:00 - 6:00 pm

All Industry Reception
OPEN

Exhibits
OPEN

5:30 - 6:00 pm

IT Brand Pulse Innovation Awards
OPEN

6:00 - 7:00 pm

IT END USER TRACK
Session EU-3: End Users Share How to Save Time and Money Today with Enterprise Flash
OPEN

continued
Thursday

8:00 - 8:30 am
Continental Breakfast

8:00 am - 2:00 pm
Registration

8:30 - 9:35 am
ENTERPRISE APPLICATIONS TRACK
Session 301-A: Flash in Hyperscale Applications, Part 2

EMBEDDED SYSTEMS TRACK
Session 301-B: Embedded Applications, Part 3

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

APPLICATIONS TRACK
Session 301-D: Local (In-Situ) Processing Applications for SSDs

SOFTWARE TRACK
Session 301-E: Software Issues

8:30 - 10:50 am
SSDS TRACK
Forum C-31: SSD Concepts

CONTROLLERS TRACK
Forum E-31: Flash Controller Design Options

PCIE STORAGE TRACK
Forum J-31: PCle/NVMe Storage

Forum L-31: Adding Low-Cost Storage to Mobile Applications w/SD Memory Cards

9:45 - 10:50 am
ENTERPRISE APPLICATIONS TRACK
Session 302-A: How Flash Will Transform Enterprise Applications

ENTERPRISE STORAGE TRACK
Session 302-B: Flash Arrays, Part 2

Session 302-C: Creating the Foundation of Flash—A Conversation with Eli Harari

NEW TECHNOLOGIES TRACK
Session 302-D: Persistent Memory Applications

TESTING TRACK
Session 302-E: Testing Issues

10:00 am - 2:00 pm
Exhibits Open

11:00 - 11:35 am
Keynote 11: TBD
Val Bercovici, Cloud Czar, NetApp

11:05 - 11:35 am
Lifetime Achievement Award

1:00 - 1:30 pm
Lunch
Exhibits Open

2:00 - 3:00 pm
Keynote 13: TBD
Narayan Venkat, CMO, Tegile

2:30 - 3:00 pm

Keynote 14: TBD
Shaun Walsh, VP Corporate Marketing, QLogic

3:10 - 4:25 pm
PCIE STORAGE TRACK
Session 303-A: PCle/NVMe Extensions

NEW TECHNOLOGIES TRACK
Session 303-B: Automotive Applications of Flash

SSDS TRACK
Session 303-C: SSD Technology

MARKET TRACK
Session 303-D: Market Research

APPLICATIONS TRACK
Session 303-E: Using Flash with a Massively Scalable Storage System (Ceph)

STANDARDS TRACK
Session 303-F: UFS: Using Mass Storage to Add Capabilities to Mobile Applications

CONTROLLERS TRACK
Session 303-G: Flash Controller LDPC Options

APPLICATIONS TRACK
Session 303-H: Applying New Non-Volatile Technologies

DATA MANAGEMENT TRACK
Session 303-I: Flash in Data Centers, Part 2

4:30 - 5:45 pm
Session 304-A: Closing Panel on Top Ten Things You Need to Know about Flash Memory Today

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

SYSTEM DEVELOPMENT TRACK
Session 304-C: Developing High-Performance Flash Systems
Travel and Lodging

AIRPORT TRANSPORTATION
Transportation is available between San Francisco, Oakland, and San Jose airports and the Santa Clara Convention Center. Services include SuperShuttle shared-ride, SuperShuttle Exclusive van ride, and ExecuCar Private Sedan and Private SUV Services.

Book Online:
http://groups.supershuttle.com/flashmemorysummit.html

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Hyatt Regency Santa Clara
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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.

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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.

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