2015 CONFERENCE GUIDE

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Learnings from Nearly a Decade of Building Low-cost Cloud Storage

Watch the Keynote by Gleb Budman, CEO, Backblaze > *Wednesday 11:20am*

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WELCOME

Greetings SDC Attendees,

On behalf of SNIA's Technical Council, Board of Directors, and Staff, welcome to the 2015 Storage Developer Conference (SDC). SNIA has been producing SDC since 1998, and this year we are again proud to offer a conference program that will keep you engaged and learning, while providing important opportunities for networking with your industry peers and leaders.

We welcome our featured speakers including Bev Crair, Vice President and General Manager, Storage Group, Intel, who will present "Innovator, Disruptor or Laggard, Where will your Storage Applications live? Next Generation Storage," and Richard McDougall, Big Data and Storage Chief Scientist, VMware, presenting "Software Defined Storage - What Does it Look Like in 3 Years?" Other mainstage speakers include Donnie Berkholz, Research Director of 451 Research; Laz Vekiarides, CTO and Co-Founder of ClearSky Data; Gleb Budman, CEO of Backblaze; and Andy Rudoff of Intel, representing SNIA's NVM Programming TWG.

We extend our thanks to each of the SDC agenda speakers and the companies they represent for dedicating their expertise and time.

In addition to multiple technical session tracks, we are offering evening Birds of a Feather sessions, as well as the SNIA SMB3 Plugfest and the Cloud Interoperability Plugfest. We encourage you to explore all facets of SDC and expect that you will find the entire experience to be valuable and edifying.

Please remember to visit the Sponsor Showcase which is located along the second floor Mezzanine. You won't want to miss the opportunity to meet with SDC sponsors and several of our association and media partners. While speaking with them, please acknowledge their support of our event.

Finally, please take a moment to complete the SDC evaluation surveys which will be e-mailed to you at the end of each day. We take your input very seriously and rely on it as we plan for next year's SDC. SNIA leaders will be available throughout the event to talk with you about the SNIA membership experience (or opportunity if not yet a member), the SNIA ROI on technical standards work, and ideas to make SNIA even more relevant in 2016.

Thank you for joining us. Have an enjoyable and productive conference!

Regards,

David Dale
Chairman,
SNIA Board of Directors

Bill Martin
Chairman,
SNIA Technical Council

Leo Leger
Executive Director,
SNIA

GENERAL INFORMATION

CONFERENCE APP

Download the SDC App to access the agenda, speaker information, session abstracts, and to keep up to date on any last minute agenda changes.

Scan the QR code below to get details about downloading the app or go to www.snia.org/app.

ACCESS TO PRESENTATIONS

To access all the presentations from the SDC conference, go to:
www.snia.org/events/storage-developer/presentation
and enter:

These presentations are only available to SDC attendees. Presentations will be available to the public 90 days after the conference.

SDC EVALUATIONS

We will be sending daily evaluations via email each night for that day's events. Please take a moment to complete these brief evaluations. The information you provide will help us in the planning and development of future conferences.

As an incentive, we will be offering a $100 gift card to a randomly selected individual that completes the evaluations. Remember, each time you complete an evaluation, your chances of winning go up!

GUIDE CONTENTS

CONNECT WITH SDC

On Twitter: @SDConference
Use #SDC15 when you are tweeting!

WIRELESS INTERNET ACCESS

During the conference complimentary wireless Internet access will be available.

Login Information:
SSID: SNIA-SDC15
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THE SDC AGENDA TEAM

SDC is owned and produced by SNIA, the Storage Networking Industry Association. The technical program for SDC was developed by the SDC Agenda Planning Team and the SNIA Technical Council, a select group of acknowledged industry experts who work to guide the SNIA's technical efforts.

SCHEDULE AT-A-GLANCE

Pre-Conference Primer Sessions - Sunday, September 20, 2015

Registration Open ..... 11:00 am - 2:00 pm
Sessions ..... 1:00 pm - 4:55 pm

Monday, September 21, 2015

Registration Opens ..... 7:30 am
Continental Breakfast ..... 7:30 am - 8:30 am
Breakout Sessions ..... 8:30 am - 5:25 pm
Lunch and Networking ..... 12:30 pm - 1:30 pm
Plugfest Open House and Reception ..... 5:30 pm - 7:00 pm

Tuesday, September 22, 2015

Continental Breakfast ..... 7:30 am - 8:45 am
Welcome Remarks ..... 8:45 am - 9:00 am
General Sessions ..... 9:00 am - 12:00 pm
Lunch and Sponsor Showcase ..... 12:00 pm - 1:00 pm
Breakout Sessions ..... 1:00 pm - 4:55 pm
Networking Reception and Sponsor Showcase ..... 5:00 pm - 7:00 pm
Birds of a Feather Meetings ..... 7:00 pm - 9:00 pm

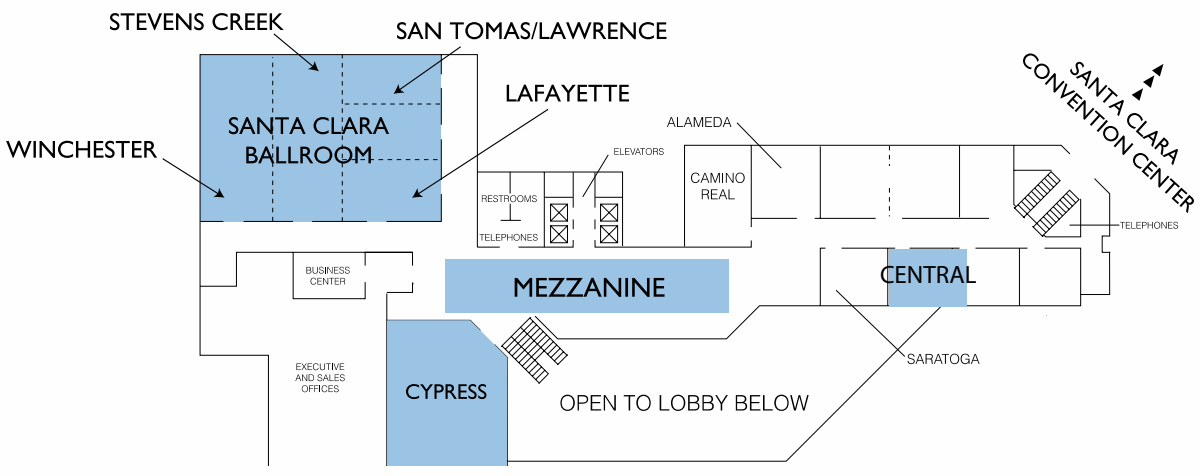
Wednesday, September 23, 2015

Continental Breakfast ..... 7:30 am - 8:45 am
Introduction to Day ..... 8:45 am - 9:00 am
General Sessions ..... 9:00 am - 12:00 pm
Lunch and Sponsor Showcase ..... 12:00 pm - 1:00 pm
Breakout Sessions ..... 1:00 pm - 5:55 pm
Birds of a Feather Meetings ..... 6:00 pm - 8:00 pm

Thursday, September 24, 2015

Continental Breakfast ..... 7:30 am - 8:45 am
Breakout Sessions ..... 8:30 am - 12:25 pm
Sessions Conclude ..... 12:25 pm
Plugfests Conclude ..... 1:00 pm

BREAKOUT SESSION ROOM MAP



4 PRE-CONFERENCE PRIMER SESSIONS

This year SDC is introducing the Pre-conference Primer Sessions as a feature to the 2015 conference. These sessions are designed to give attendees an overview of important storage technologies.

Primer sessions are included with SDC full-conference registration. If you are not registered for SDC, there is a $49.00 fee for this afternoon of sessions, and if you choose to attend SDC, your $49 fee will be applied toward your full conference pass.

11:00 - 2:00	Registration Open		
	Persistent Memory (Winchester)	**Cloud and Interop (Stevens Creek)**	**Data Center Infrastructure (Cypress)**
1:00 - 1:50	Advances in Non-Volatile Storage Technologies Thomas Coughlin President, Coughlin Associates Edward Grochowski Storage Consultant, Self Employed	What You Need to Know on Cloud Storage David Slik Technical Director, NetApp Mark Carlson Principal Engineer, Industry Standards, Toshiba	Next Generation Data Centers: Hyperconverged Architectures Impact On Storage Mark OConnell Distinguished Engineer, EMC
2:00 - 2:50	Understanding the Intel/Micron 3D XPoint Memory Jim Handy General Director, Objective Analysis		PCI Express: Driving the Future of Storage Ramin Neshati PCI-SIG Board Member and Marketing Chair, PCI-SIG
2:50 - 3:05		Break	
3:05 - 3:55	Nonvolatile Memory (NVM), Four Trends in the Modern Data Center, and the Implications for the Design of Next Generation Distributed Storage Platforms David Cohen System Architect, Intel Brian Hausauer Hardware Architect, Intel	Using REST API for Management Integration Brian Mason MTS-SW, Netapp	Next Generation Low Latency Storage Area Networks Rupin Mohan Chief Technologist - Storage Networking, HP
4:05 - 4:55	Developing Software for Persistent Memory Dr. Thomas Willhalm Senior Application Engineer, Intel Karthik Kumar Senior Application Engineer, Intel	SNIA Tutorial Windows Interoperability Workshop Christopher Hertel Software Senior Program Engineer, Samba Team / Dell Compellent	The Pros and Cons of Developing Erasure Coding and Replication Instead of Traditional RAID in Next-Generation Storage Platforms Abhijith Shenoy Engineer, Hedvig

GENERAL SESSIONS

All General Sessions take place in the Santa Clara Ballroom.

TUESDAY SPEAKERS

9:00 AM - 9:45 AM
Innovator, Disruptor or Laggard, Where Will Your Storage Applications Live? Next Generation Storage
Bev Crair, Vice President and General Manager, Storage Group, Intel

9:45 AM - 10:25 AM
The Long-Term Future of Solid State Storage
Jim Handy, General Director, Objective Analysis

10:40 AM - 11:20 AM
Concepts on Moving From SAS Connected JBOD to an Ethernet Connected JBOD
Jim Pinkerton, Partner Architect Lead, Microsoft

11:20 AM - 12:00 PM
Planning for the Next Decade of NVM Programming
Andy Rudoff, SNIA NVM Programming TWG, Intel

WEDNESDAY SPEAKERS

9:00 AM - 9:45 AM
Software Defined Storage - What Does it Look Like in 3 Years?
Richard McDougall, Big Data and Storage Chief Scientist, VMware

9:45 AM - 10:25 AM
Why the Storage You Have is Not the Storage Your Data Needs
Laz Vekiarides, CTO and Co-founder, ClearSky Data

10:40 AM - 11:20 AM
Emerging Trends in Software Development
Donnie Berkholz, Research Director, 451 Research

11:20 AM - 12:00 PM
Learnings from Nearly a Decade of Building Low-cost Cloud Storage
Gleb Budman, CEO, Backblaze

MONDAY AGENDA

7:30	Registration Opens (Mezzanine)				
7:30 - 8:45	Continental Breakfast (Mezzanine)				
	File Systems (Winchester)	**/etc (Cypress)**	**Cloud (Lafayette)**	**Protocols (Stevens Creek)**	**Management (San Tomas/Lawrence)**
8:30 - 9:20	Learnings from Creating Plugin Module for OpenStack Manila Services Vinod Eswaraprasad Software Architect, Wipro	Implications of Emerging Storage Technologies on Massive Scale Simulation Based Visual Effects Yahya H. Mirza CEO/CTO, Aclectic Systems	Using CDMI to Manage Swift, S3, and Ceph Object Repositories David Slik Technical Director, NetApp	Using iSCSI or iSER? Ásgeir Eiriksson Chief Technology Officer, Chelsio Communications	DMTF Redfish Overview Jeff Autor Distinguished Technologist, HP
9:30 - 10:20	Leveraging BTRFS, Linux and Open Source in Developing Advanced Storage Solutions Suman Chakravartula Maintainer, Rockstor	How Did Human Cells Build a Storage Engine? Sanjay Joshi CTO Life Sciences, EMC	Unistore: A Unified Storage Architecture for Cloud Computing Yong Chen Assistant Professor, Texas Tech University	Linux SMB3 and pNFS - Shaping the Future of Network File Systems Steven French Principal System Engineer, Samba Team/ Primary Data	The State of SMI-S - The Standards Based Approach for Managing Infrastructure Chris Lionetti Reference Architect, NetApp
10:20 - 10:35			Break (Mezzanine)		
10:35- 11:25	Apache HDFS: Latest Developments and Trends Jakob Homan Distributed Systems Engineer, Microsoft	Apache Ignite - In-Memory Data Fabric Nikita Ivanov CTO, GridGain Systems	The Developer's Dilemma: Do-It-Yourself Storage or Surrender Your Data? Luke Behnke VP of Product, Bitcasa	Move Objects to LTFS Tape Using HTTP Web Service Interface Matt Starr Chief Technical Officer, Spectra Logic Jeff Braunstein Developer Evangelist, Spectra Logic	Enterprise-Grade Array-Based Replication and Disaster Recovery with SMI-S, Windows Server, System Center and Azure Site Recovery Amit Virmani Senior Software Engineer, Microsoft Jeff Li Senior Software Engineer, Microsoft
11:35 - 12:25	A Pausable File System James Cain Principal Software Architect, Quantel Limited	Integrity of In-memory Data Mirroring in Distributed Systems Tejas Wanjari Senior Software Engineer, EMC Data Domain	How to Test CDMI Extension Feature Like LTFS, Data Deduplication, and OVF, Partial - Value Copy Functionality: Challenges, Solutions and Best Practice? Sachin Goswami Solution Architect and Storage COE Head Hi Tech, TCS	**Networking (Stevens Creek)** Benefits of NVMe Over Fabrics and Demonstration of a Prototype Rob Davis VP of Storage Technology, Mellanox Technologies	**Deduplication (San Tomas/Lawrence)** Taxonomy of Differential Compression Liwei Ren Scientific Adviser, Trend Micro
12:30 - 1:30	Lunch (Terra Courtyard)				

MONDAY AGENDA

	File Systems (Cypress)	Testing (San Tomas/Lawrence)	Deduplication (Winchester)	Networking (Lafayette)	Distributed Systems (Stevens Creek)
1:30 - 2:20	Storage Solutions for Tomorrow's Physics Projects Ulrich Fuchs Service Manager, CERN	Thousands of Users - Do You Need to Test with Them or Not? Christina Lara Senior Software Engineer, IBM Julian Cachua Software Engineer, IBM	Design Decisions and Repercussions of Compression and Data Reduction in a Storage Array Chris Golden Software Engineer, Pure Storage	Implementing NVMe Over Fabrics Wael Noureddine VP Technology, Chelsio Communications	New Consistent Hashing Algorithms for Data Storage Jason Resch Software Architect, Cleversafe
2:30 - 3:20	Storage Class Memory Support in the Windows Operating System Neal Christiansen Principal Development Lead, Microsoft	Object and Open Source Storage Testing: Finally, a Viable Approach Tim Van Ash VP of Product Management, Load DynamiX	**Database (Winchester)** The Lightning Memory-Mapped Database Howard Chu CTO, Symas	A Cost Effective, High Performance, Highly Scalable, Non-RDMA NVMe Fabric Bob Hansen VP Systems Architecture, Apeiron Data Systems	DAOS - An Architecture for Extreme Scale Storage Eric Barton Lead Architect - High Performance Data Division, Intel
3:20 - 3:35			Break (Mezzanine)		
3:35 - 4:25	ZFS Async Replication Enhancements Richard Morris Principal Software Engineer, Oracle Peter Cudhea Principal Software Engineer, Oracle	Parallelizing a Distributed Testing Environment Teague Algie Software Developer, Cleversafe	The Bw-Tree Key-Value Store and Its Applications to Server/Cloud Data Management in Production Sudipta Sengupta Principal Research Scientist, Microsoft Research	SNIA Tutorial SCSI Standards and Technology Update Rick Kutcipal Product Planning - Data Center Storage Group, Avago Technologies Greg McSorley Vice President, SCSI Trade Association	Beyond Consistent Hashing and TCP: Vastly Scalable Load Balanced Storage Clustering Alex Aizman CTO and Founder, Nexenta Systems Caitlin Bestler Senior Director of Arch, Nexenta Systems
4:35 - 5:25	ReFS v2: Cloning, Projecting, and Moving Data J.R. Tipton Development Lead, Microsoft	**Solid State (San Tomas/Lawrence)** Standardizing Storage Intelligence and the Performance and Endurance Enhancements it Provides Bill Martin Principal Engineer Storage Standards, Samsung Changho Choi Principal Engineer, Samsung Semiconductor	IMDB NDP Advances Gil Russell Principal Analyst, Semiscape	Growth of the iSCSI RDMA (iSER) Ecosystem Rob Davis VP of Storage Technology, Mellanox Technologies	**Cloud and Files (Stevens Creek)** Big Data Analytics on Object Stoage - Hadoop Over Ceph Object Storage with SSD Cache Yuan Zhou Software Engineer, Intel Asia R&D
5:30 - 7:00	Plugfest Open House and Reception (Magnolia Room)				

TUESDAY AGENDA

7:30 - 8:45	Continental Breakfast (Mezzanine)
8:45 - 9:00	Welcome Remarks (Santa Clara Ballroom) David Dale, Chairman, SNIA Board of Directors
9:00 - 9:45	Innovator, Disruptor or Laggard, Where Will Your Storage Applications Live? Next Generation Storage (Santa Clara Ballroom) Bev Crair, Vice President and General Manager, Storage Group, Intel
9:45 - 10:25	The Long-Term Future of Solid State Storage (Santa Clara Ballroom) Jim Handy, General Director, Objective Analysis
10:25 - 10:40	Break (Mezzanine)
10:40 - 11:20	Concepts on Moving From SAS Connected JBOD to an Ethernet Connected JBOD (Santa Clara Ballroom) Jim Pinkerton, Partner Architect Lead, Microsoft
11:20 - 12:00	Planning for the Next Decade of NVM Programming (Santa Clara Ballroom) Andy Rudoff, SNIA NVM Programming TWG, Intel
12:00 - 1:00	Lunch and Sponsor Showcase (Mezzanine)

	File Systems (Lafayette)	Persistent Memory (Cypress)	Shingled Magnetic Recording (SMR) (Stevens Creek)	SMB (Winchester)	Software Defined Storage (San Tomas/Lawrence)
1:00 - 1:50	Achieving Coherent and Aggressive Client Caching in Gluster, a Distributed System Poornima Gurusiddaiah, Software Engineer, Red Hat Soumya Koduri, Senior Software Engineer, Red Hat India	Preparing Applications for Persistent Memory Doug Voigt, Distinguished Technologist, HP	SMR - The Next Generation of Storage Technology Jorge Campello, Director of Systems - Architecture and Solutions, HGST	SMB 3.1.1 Update Greg Kramer, Principal Software Engineer, Microsoft Dan Lovinger, Principal Software Engineer, Microsoft	Introduction to CoprHD: An Open Source Software Defined Storage Controller Anjaneya Chagam, Principal Engineer, Intel Urayoan Irizarry, Consultant Software Engineer, EMC
2:00 - 2:50	Petabyte-Scale Distributed File Systems in Open Source Land: KFS Evolution Sriram Rao, Partner Scientist Manager, Microsoft	Managing the Next Generation Memory Subsystem Paul von Behren, Software Architect, Intel	Host Managed SMR Albert Chen, Engineering Program Director, WDC Jim Malina, Technologist, WDC	Samba and SMB3: Are We There Yet? Ira Cooper, Principal Software Engineer, Red Hat	Software Defined Storage Based on Direct Attached Storage Slava Kuznetsov, Principal Software Engineer, Microsoft
2:50 - 3:05			Break (Mezzanine)		
3:05 - 3:55	High Resiliency Parallel NAS Cluster Richard Levy, CEO and President, Peer Fusion	SNIA Tutorial The NVDIMM Cookbook: A Soup-to-Nuts Primer on Using NVDIMMs to Improve Your Storage Performance Jeff Chang, VP Marketing & Business Development, AgigA Tech Arthur Sainio, Sr. Director Marketing, Smart Modular	SNIA Tutorial FS Design Around SMR: Seagate's Journey and Reference System with EXT4 Adrian Palmer, Drive Development Engineering, Seagate Technologies	Tuning an SMB Server Implementation Mark Rabinovich, R and D Manager, Visuality Systems	**Cloud and Files (San Tomas/Lawrence)** GlusterFS - The Thrilla in Manila Ramnath Sai Sagar, Cloud Technical Marketing Manager, Mellanox Sean Murphy, Principle Product Manager, RedHat
4:05 - 4:55	Bridging On-Premises File Systems and Cloud Storage Pankaj Datta, Consultant Software Engineer, Isilon Storage Division EMC	Building NVRAM Subsystems in All-Flash Storage Arrays Pete Kirkpatrick, Principal Engineer, Pure Storage	An SMR-Aware Append-Only File System Stephen Morgan, Senior Staff Research Engineer, Huawei Chi-Young Ku, Senior Consultant, Huawei	Azure File Service: 'Net Use' the Cloud David Goebel, Software Engineer, Microsoft	**Distributed Systems (San Tomas/Lawrence)** Real World Use Cases for Tachyon, a Memory-Centric Distributed Storage System Haoyuan Li, CEO, Tachyon Nexus
5:00 - 7:00	Networking Reception and Sponsor Showcase (Mezzanine)				
7:00 - 9:00	Birds of a Feather Meetings - See page 12 for details				

WEDNESDAY AGENDA

7:30 - 8:45	Continental Breakfast (Mezzanine)
8:45 - 9:00	Introduction to the Day and Housekeeping Announcements (Santa Clara Ballroom) Bill Martin, Chairman, SNIA Technical Council
9:00 - 9:45	Software Defined Storage - What Does it Look Like in 3 Years? (Santa Clara Ballroom) Richard McDougall, Big Data and Storage Chief Scientist, VMware
9:45 - 10:25	Why the Storage You Have is Not the Storage Your Data Needs (Santa Clara Ballroom) Laz Vekiarides, CTO and Co-founder, ClearSky Data
10:25 - 10:40	Break (Mezzanine)
10:40 - 11:20	Emerging Trends in Software Development (Santa Clara Ballroom) Donnie Berkholz, Research Director, 451 Research
11:20 - 12:00	Learnings from Nearly a Decade of Building Low-cost Cloud Storage (Santa Clara Ballroom) Gleb Budman, CEO, Backblaze
12:00 - 1:00	Lunch and Sponsor Showcase (Mezzanine)

	Security (Lafayette)	Persistent Memory (Cypress)	Shingled Magnetic Recording (SMR) (Stevens Creek)	SMB (San Tomas/Lawrence)	New Thinking (Winchester)
1:00 - 1:50	Hackers, Attack Anatomy and Security Trends Geoff Gentry, Regional Director, Independent Security Evaluators	Remote Access to Ultra-low-latency Storage Tom Talpey, Architect, Microsoft	Strategies for Using Standard File systems on SMR Drives Hannes Reinecke, Senior Engineer, SUSE	SMB3 Multi-Channel in Samba Michael Adam, Principal Software Engineer, Red Hat	f4: Facebook's Warm BLOB Storage System Satadru Pan, Software Engineer, Facebook
2:00 - 2:50	Mobile and Secure: Cloud Encrypted Objects Using CDMI David Slik, Technical Director Object Storage, NetApp	Solving the Challenges of Persistent Memory Programming Sarah Jelinek, Senior SW Engineer, Intel	Implement Object Storage with SMR based Key-Value Store Qingchao Luo, Massive Storage Chief Architect, Huawei	The Past, Present and Future of Samba Messaging Volker Lendecke, Developer, Samba Team / SerNet	Pelican: A Building Block for Exascale Cold Data Storage Austin Donnelly, Principal Research Software Development Engineer, Microsoft
2:50 - 3:05			Break (Mezzanine)		
3:05 - 3:55	OpenStack Swift On File: User Identity For Cross Protocol Access Demystified Dean Hildebrand, IBM Master Inventor and Manager, Cloud Storage Software, IBM Sasikanth Eda, Software Engineer, IBM	RDMA with PM: Software Mechanisms for Enabling Persistent Memory Replication Chet Douglas, Principal SW Architect, Intel	Integrating Cooperative Flash Management with SMR Technology for Optimized Tiering in Hybrid Systems Alan Chen, Principal Software Architect, Radian Memory Systems	Calling the Witness: SMB3 Failover with Samba/CTDB Günther Deschner, Developer, Red Hat / Samba Team José Rivera, Software Engineer, Red Hat / Samba Team	Torturing Databases for Fun and Profit Mai Zheng, Assistant Professor Computer Science Department - College of Arts and Sciences, New Mexico State University

WEDNESDAY AGENDA

	Security (Lafayette)	Object Drives (Cypress)	Performance (Stevens Creek)	SMB (San Tomas/Lawrence)	New Thinking (Winchester)
4:05 - 4:55	Multi-Vendor Key Management with KMIP Tim Hudson CTO and Technical Director, Cryptsoft	SNIA Tutorial Object Drives: A New Architectural Partitioning Mark Carlson Principal Engineer, Industry Standards, Toshiba	Designing SSD-Friendly Applications Zhenyun Zhuang Senior Performance Engineer, LinkedIn	SMB 3.0 Transparent Failover for EMC Isilon OneFS John Gemignani Senior Consultant, Isilon Storage Division, EMC	Skylight — A Window on Shingled Disk Operation Peter Desnoyers Professor College of Computer and Information Science, Northeastern University
5:05 - 5:55	Network Bound Encryption for Data-at-Rest Protection Nathaniel McCallum Senior Software Engineer, Red Hat	Beyond LBA: New Directions in the Storage Interface Abhijeet Gole Senior Director of Engineering, Toshiba	Load-Sto-Meter: Generating Workloads for Persistent Memory Doug Voigt Distinguished Technologist, HP Damini Ashok Chopra Software Intern - Office of Chief Technologist, HP	The Future is Cloudy - Samba Gateways to a Cloud Storage World Jeremy Allison Engineer, Google Samba Team	**NVMe Fabric (Winchester)** Donard: NVM Express for Peer-2-Peer between SSDs and other PCIe Devices Stephen Bates Technical Director, PMC-Sierra
6:00 - 8:00	Birds of a Feather Meetings - See page 12 for details				

What is a SNIA Tutorial ?

SNIA Tutorials are educational materials intended to present technical and business issues covering Information Technology in a fair and unbiased manner. They are designed to give an industry view of particular topics, from the viewpoint of the entire industry or a significant segment, and they are presented at various levels, ranging from IT or business manager level to the software/hardware developer level.

Developed by SNIA member participants, all SNIA Tutorials are peer reviewed by members of the SNIA in an open process to ensure quality and vendor neutrality. This review process is open to all SNIA members and announced at specific times during the year.

SNIA Tutorials are presented at multiple venues, conferences and at any SNIA hosted or SNIA supported events worldwide. Tutorials are copyrighted and jointly owned by the SNIA and the author.

SNIA Global Education

THURSDAY AGENDA

	NFS (Lafayette)	Hardware (Cypress)	Performance (Lawrence)	NVM Programming (San Tomas)
7:30 - 8:45	Continental Breakfast (Mezzanine)			
8:30 - 9:20	Introduction to Highly Available NFS Server on Scale-Out Storage Systems Based on GlusterFS Soumya Koduri Senior Software Engineer, Red Hat India Meghana Madhusudhan Software Engineer, Red Hat	Designing Highly Optimized Storage Accelerators with Customizable FPGA-Based Flash Server Cards Amit Saxena Vice President of Engineering, Digital IP Business Unit	Application-Level Benchmarking with SPEC SFS 2014 Nick Principe Senior Software Engineer, EMC Vernon Miller Performance Engineer, IBM	SNIA Tutorial The NVM Revolution Paul von Behren Software Architect, Intel
9:30 - 10:20	Instantly Finding a Needle of Data in a Haystack of Large-Scale NFS Environment Gregory Touretsky Product Manager, Infinidat	PCI Express Non-Transparent Bridging for RDMA Roland Dreier Member of Technical Staff, Pure Storage	Online Cache Analysis And Its Applications For Enterprise Storage Systems Irfan Ahmad CTO, CloudPhysics	**Virtualization (San Tomas)** Avoiding Common Storage Development Pitfalls: A Review of the Approaches and Lessons Learned with the VMware vSphere Platform Scott Davis Chief Technology Officer, Infinio Systems
10:20 - 10:35		Break (Mezzanine)		
10:35 - 11:25	pNFS/RDMA: Possibilities Chuck Lever Linux Kernel Architect, Oracle	The Changing Storage Testing Landscape Peter Murray Product Evangelist Load DynamiX	SNIA Tutorial NVDIMM-SSDs Tested to the SNIA SSD Performance Test Specification Eden Kim CEO, Calypso Systems	Seamless Live Virtual Machine Migration by Mitigating Shared Storage Resource Constraint Sangeeth Keeriyadath Sr. Staff Software Engineer, IBM Prasanth Jose Sr. Staff Software Engineer, IBM
11:35 - 12:25	**Distributed Systems (Lafayette)** Where Moore's Law Meets the Speed of Light: Optimizing Exabyte-Scale Network Protocols Yogesh Vedpathak Software Developer, Cleversafe	RAIDShield: Characterizing, Monitoring, and Pro-actively Protecting Against Disk Failures Ao Ma Principal Engineer, EMC	Storage Performance Analysis for Big Data Processing Da Qi Ren Staff Research Engineer, Huawei Zane Wei Director, Huawei	I/O Virtualization in Enterprise SSDs Zhimin Ding Principle Engineer Design, Toshiba
12:25	Sessions Conclude			
1:00	Plugfests Conclude			

SAVE THE DATE: SDC 2016

SNIA will host its annual Storage Developer Conference at this same venue next year on September 19 - 22, 2016. Plan to attend and watch for the Call for Presentations to open in February 2016.

12 BIRDS OF A FEATHER MEETINGS

SDC is pleased to offer a variety of Birds of a Feather meetings (BOFs). These meetings will take place in the evening after the breakout sessions. You do not need to be registered for SDC to attend these special meetings.

TUESDAY MEETINGS

Getting Started with the CDMI Conformance Test Program Time: 7:00 PM - 8:00 PM Location: Winchester Room
The SNIA Cloud Data Management Interface (CDMI) is an ISO/IEC standard that enables cloud solution vendors to meet the growing need of interoperability for data stored in the cloud. The CDMI Conformance Test Program (CTP) is now available. Administered by Tata Consulting Services, the CDMI CTP validates a cloud product's conformance to the CDMI standard. Come to this Birds of a Feather session to learn what the CTP program entails, details on the testing service that is offered, how to get the CTP process started, and pricing. Please note: The availability of CDMI conformance testing at the Cloud Plugfest is happening at SDC.

Enabling Persistent Memory Applications with NVDIMMs Time: 7:00 PM - 8:00 PM Location: Stevens Creek Room
Non-Volatile DIMMs, or NVDIMMs, have emerged as a go-to technology for boosting performance for next generation storage platforms. The standardization efforts around NVDIMMs have paved the way to simple, plug-n-play adoption. Join the SNIA SSSI NVDIMM Special Interest Group for an interactive discussion on "What's Next?" - what customers, storage developers, and the industry would like to see to improve and enhance NVDIMM integration and optimization.

Storage Architectures for IoT Time: 8:00 PM - 9:00 PM Location: Stevens Creek Room
The Internet of Things (IoT) is expected to produce massive amounts of data streaming in from sensors. This data needs to be stored and analyzed, sometimes in real time. What are the best storage architectures for this use case? Is Hyper-Converged an answer? What about In-Storage Compute? Come to this BoF to learn what ideas are out there and contribute your own.

NAS Benchmarking and SFS 2014 Forum Time: 8:00 PM - 9:00 PM Location: Stevens Creek Room
Join several SPEC SFS subcommittee members for discussions about SFS development work and an open Q&A session - bring your questions and feedback! We would also like to follow onto the very successful NAS Benchmarking session with an open Q&A with some of the presenters of that tutorial.

WEDNESDAY MEETINGS

Moving Data Protection to the Cloud: Trends, Challenges and Strategies Time: 6:00 PM - 7:00 PM Location: Stevens Creek Room
There are various new ways and advantages to perform data protection using the Cloud. However, Developers need to carefully study all the alternative approaches and the experiences of others (good and bad) to avoid the pitfalls, especially during the transition from strictly local resources to cloud resources. At this BoF we will discuss: Critical cloud data protection challenges; How to use the cloud for data protection; Pros and cons of various cloud data protection strategies; Experiences of others (good and bad) to avoid common pitfalls; Cloud standards in use – and why you need them.

Storage for Containers Time: 6:00 PM - 7:00 PM Location: Winchester Room
This talk will demonstrate a case study on how the above goals can be met for Docker ecosystem. Docker ecosystem is not completely evolved to meet the needs of mission critical databases to be run in Docker containers. As a result, there is hesitation in moving enterprise class and mission critical databases from physical/virtual machine platforms to containers. Elaborating on each of the above objectives, the talk intends to inspire confidence to deploy mission critical databases in Docker containers.

NVMe over Fabrics Time: 6:00 PM - 7:00 PM Location: Cypress Room
This one hour session with panel of experts from the industry will focus on explaining a need for new storage networking protocols for both NAND and emerging Non-volatile memory devices. The pressure to reduce network latency to scale comparable with new solid state devices requires rethinking and reengineering of storage networking protocols. We will discuss the benefits of NVMe over fabrics protocol that utilizes RDMA networking, and present recent measured prototyping data. Panel of experts will be available to answer questions from attendees.

SNIA and OpenStack: Standards and Open Source Time: 7:00 PM - 8:00 PM Location: Stevens Creek Room
SNIA has created a number of educational materials for OpenStack Storage, which have become some of the most popular content produced. The SNIA has now created a Task Force to investigate a new focused set of activities around OpenStack which may result in a new group targeted at the adoption of storage industry standards in this open source project. Come join the members of this new task force in discussing the requirements and needs in this space.

PLUGFESTS

Plugfests are only open to registered participants, except during the Open House on Monday evening.

SNIA SMB3 PLUGFEST

Sunday 8:30 AM - Thursday 1:00 PM • Magnolia Room • Underwritten by Microsoft in partnership with NetApp

The purpose of this Plugfest is for vendors to bring their implementations of SMB3 to test, identify, and fix bugs in a collaborative setting with the goal of providing a forum in which companies can develop interoperable products. The participants of the Plugfest work together to define the testing process, assuring that objectives are accomplished.

2015 SNIA SMB3 Plugfest Participants (As of 9/14/15)

CLOUD INTEROPERABILITY PLUGFEST

Monday, 8:00 AM - Thursday 1:00 PM • Central Room • Underwritten by SNIA Cloud Storage Initiative

Cloud Plugfests are work-oriented gatherings of developers and participants in standards organization projects and framework project developers designed to promote interchange of methods, tools and techniques that are defined by the plugfest participants as being suitable to test features such as portability, interoperability, ease of use, self-consistency and security when used in a cloud setting.

Participants at the Cloud Interoperability Plugfest will test the interoperability of well adopted cloud storage interfaces. We always have a large showing of CDMI implementations at this event, but are also looking for implementations of S3 and Swift (and Cinder/Manila) interfaces.

SDC SPONSORS

PLATINUM LEVEL

Backblaze is a leading cloud storage company that stores over 150 petabytes of customer data andhas recovered over 10 billion files for its customers. The company won the SIIA CODiE for Best Cloud Storage and secured a spot on Deloitte's Fast 500 fastest growing technology companies as a result of its 917% five-year revenue growth.

The company has built its own storage server, the Storage Pod, for 1/10th the cost of other offerings and has open sourced the hardware. Backblaze has also built its own zettabyte-scale cloud storage file system, Backblaze Vaults.

For more information, visit www.Backblaze.com, and sign-up for the blog to get hard drive prices and reliability statistics, open source storage hardware designs, and more cloud storage insights.

Intel is a world leader in computing innovation. The company designs and builds the essential technologies that serve as the foundation for the world's computing devices. Additional information about Intel is available at www.intel.com.

GOLD LEVEL

HP creates new possibilities for technology to have a meaningful impact on people, businesses, governments and society. With the broadest technology portfolio spanning printing, personal systems, software, services and IT infrastructure, HP delivers solutions for customers' most complex challenges in every region of the world. More information about HP is available at http://www.hp.com.

Adhering to the principle of "Converged Storage Makes Business More Agile," the **Huawei** storage product line focuses on IT infrastructure and possesses a complete range of products that meets entry-level, mid-range, and high-end enterprise application requirements, big data and vertical industry requirements, and cloud storage application and service requirements. The Huawei OceanStor products include the 18000 series enterprise storage, the midrange unified 6000/5000/2000 series, big data 9000 series, all-flash Dorado series, cloud storage UDS series, disaster recovery solutions with corresponding HDP/VTL/VIS components, and others. Huawei Storage provides intelligent and converged storage solutions to help customers easily deal with rapidly increasing data volumes, and the risks caused by poorly defined storage system needs, thereby reducing the TCO and meeting the changing requirements of virtualization, big data, mobile and social networking, and other scenarios. At the same time, in the spirit of openness and collaboration, Huawei has joined hands with more than 500 partners, including Intel, SAP, Seagate, Microsoft, and Sobey, to provide a complete lineup of storage solutions for all industries. These solutions help enterprises build advanced and efficient IT platforms to improve their operational efficiency, extract value from data, and grow along with Huawei.

At **Radian Memory Systems** we're redefining software to enable the next generation of data center Flash storage. By utilizing a system-driven approach to software/firmware memory management, our Symphonic technology replaces the SSD Flash-Translation-Layer (FTL) to unlock the native potential of Flash memory and deliver unprecedented performance and cost efficiencies with the functionality required of data center class products.

Our technology and products target system OEMs, cloud and service providers, and licensing to device-based manufacturers to support primary storage requirements throughout the data center. User applications range from the latest webscale and big data frameworks to virtual machines and transaction processing. Product sales are handled directly and in partnership with industry leading distributors.

SILVER LEVEL

Celestica is a global supply chain services company, delivering the highest quality for their customers' most demanding products. They have leveraged their 20-years of experience with the world's leading technology companies to develop their innovative Joint Design and Manufacturing (JDM) service offering. Through JDM, Celestica delivers comprehensive product roadmaps for storage, server and networking, with both collaborative design and whitebox engagement models. They are constantly evolving their JDM building blocks to deliver next-generation technologies and converged solutions for these markets.

Chelsio is a recognized leader in high performance (10G/40G/100G) Ethernet adapters for networking and storage within virtualized enterprise data centers, public and private hyperscale clouds, and cluster computing environments. Chelsio's innovative, fifth generation protocol acceleration technology (T5) powers its high performance 10G/40G Ethernet adapters with a clear roadmap for 25G/100G Ethernet solutions in 2016. The Chelsio Unified Wire fully offloads all protocol traffic, providing no-compromise performance with high packet processing capacity, sub-microsecond hardware latency and high bandwidth. Visit the company at www.chelsio.com.

With backup and recovery, one size doesn't fit all.

Your budget, environment, retention policies and recovery needs shouldn't be shoehorned into a boilerplate backup and recovery solution. At **Dell** we tailor our solutions to perfectly fit your company's unique backup requirements. From application backups to licensing, SLA requirements to external backup appliances, we give you the power to choose what your company needs — not what another company says you need.

With reduced complexity, broad platform support and virtually zero data loss and downtime, we help you match your backup to your business, so you're thinking less about backup and recovery, and more about getting work done. Ready to talk about Data Protection?

SDC SPONSORS

HGST is a global leader in data storage, unlocking potential by helping the world harness the power of data. With a deep understanding of industry needs and a changing technology landscape, HGST is driving data center transformation with innovative, proven, smarter storage solutions that optimize capacity, performance, efficiency and reliability with the lowest TCO. Trusted by the world's largest organizations, HGST'S storage solutions are everywhere, touching lives and enabling possibilities for the enterprise, cloud computing and sophisticated infrastructures in health-care, energy, finance and government. www.hgst.com

Load DynamiX solutions are used to test networked storage performance. The company empowers IT organizations and technology vendors with critical insight to maximize storage system performance by validating real-world application workloads before production deployment. Organizations reduce risk and save money when using Load DynamiX.

SerNet is the leading service provider for the open source software SAMBA. Since 1996 members of the international SAMBA core team work with SerNet and offer support for vendors, system integrators and consulting companies. The SAMBA core team is a group of individuals that work for a variety of companies all over the world.

SMART Modular Technologies is a leader in the design, manufacture and supply of specialty memory and storage solutions providing standard and custom products to today's leading global OEMs crossing all major electronic industries. These industries include computing, networking, mobile, telecom, printer, storage, automotive, communications and industrial electronics markets.

Visuality Systems is the World's leader for SMB based Embedded and Mobile Systems. Visuality Systems since its establishment in 1998 is fully dedicated for providing and continually developing the NQE™.

NQE™ Client/Server middle-ware provides a practical, simple to implement and quick to market SMB solution through integration of the Microsoft Windows networking file sharing functions.

With over 100 Blue Chip clients worldwide, ranging from Consumer devices, Aerospace and Defense, Medical, Industrial Automation, and Smart devices. NQE™ is the World leader in the embedded field with close to and even maybe 100% of market share.

At the beginning of 2016, Visuality Systems is scheduled to grow its product family by releasing NQ™ Storage, which will deliver Microsoft's Server Message Block connectivity for the non-Windows Storage Enterprise market.

SNIA SMB3 PLUGFEST UNDERWRITERS

Microsoft

Founded in 1975, **Microsoft** is the worldwide leader in software, services and solutions that help people and businesses realize their full potential.

NetApp™

NetApp creates innovative storage and data management solutions that deliver outstanding cost efficiency and accelerate business breakthroughs. Our dedication to the principles of simplicity, innovation, and customer success has made us one of the fastest-growing storage and data management providers today. Customers around the world choose us for our "go beyond" approach and broad portfolio of solutions for business applications, storage for virtual servers, disk-to-disk backup, and more. Our solutions and virtualized storage technologies can provide nonstop availability of critical business data and speed product development, so you can deploy new capabilities with confidence and get to revenue faster than ever before. You can rely on our industry-leading solutions to lower the cost of protecting your data, business, and reputation.

CLOUD INTEROPERABILITY PLUGFEST UNDERWRITER

SNIA™ Cloud Storage Initiative

The **SNIA Cloud Storage Initiative** (CSI) is committed to the adoption, growth and standardization of cloud storage and related cloud data services to promote interoperability and portability of data stored in the cloud. Activities including providing external advocacy in support of the SNIA Cloud Storage Technical Work Group (TWG), interoperability Plugfests, and standards conformance testing.

MEDIA PARTNER AND BROADCAST PROVIDER

BrightTALK provides webinars and videos for professionals and their communities. Every day thousands of thought leaders are actively sharing their insights, their ideas and their most up-to-date knowledge with professionals all over the globe through the technologies that BrightTALK has created.

CONTRIBUTING

DDN®

DDN is The Leading Big Data Storage Supplier to Data-Intensive, Global Organizations. For over 15 years, DDN has designed, developed, deployed and optimized systems, software and solutions which enable enterprises, service providers, universities and government agencies to generate more value and accelerate time to insight from their data and information, on premise and in the cloud.

Organizations leverage the power of DDN technology and the deep technical expertise of our team to capture, store, process, analyze, collaborate and distribute data, information and content at largest scale in the most efficient, reliable and cost effective manner. DDN's sustained Vision and execution have made us the World's largest privately held data storage company.

INFINIO®

Infinio is a leading provider of software-based storage acceleration that enables organizations to increase storage performance separately from storage capacity, reducing cost and complexity. An alternative to hardware solutions, Infinio creates a shared, deduplicated caching layer from small amounts of RAM in servers, improving performance by 10x with disruptive storage economics, no downtime and no changes to the existing environment.