

Unleash the Power of Information

Chat Transcript May 16, 2005

Chat Panelists

- **Ann Livermore** Executive Vice President, Technology Solutions Group
- **Bob Schultz** Senior Vice President & General Manager, StorageWorks Division
- **Frank Harbist** Vice President and General Manager, Storage Software, StorageWorks Division
- **Duncan Campbell** Vice President Marketing, StorageWorks Division
- **Mike Feinberg** Vice President and Chief Technology Officer, StorageWorks Division
- **Kyle Fitze** Director, Product Marketing, Storage Area Networks, StorageWorks Division
- **Harry Baeverstad** Network Attached Storage Director, StorageWorks Division
- **Rusty Smith** Director, StorageWorks Portfolio Management, StorageWorks Division
- **Rick Luttrall** Chief Technical Strategist, Nearline Storage, StorageWorks Division
- **Thomas Goepel** Portfolio Manager, Storage Services, Technology Solutions Group

Please note: Questions in this transcript are not listed in the order in which they were received during the live chat. They have been grouped within content categories for quick and easy reference.

HP Storage Strategy

Q: It feels like you've taken a couple of years to do a significant refresh in storage. What took so long?

Bob Schultz (A): There has been a lot of anticipation in the market and resulting focus on the enhancement of the EVA announced today. However, there have been many introductions over the past year. These included innovations such as the Fibre Attached Technology Adapted (FATA) disks on the EVA, the ProLiant Storage Server, the XP12000 Disk Array, integrated server/storage management, support of metro-cluster and continental cluster on the EVA, and many others. You'll see us continue to move at the pace we set today as we invest in our portfolio, integrate across the enterprise, and innovate on the StorageWorks Grid architecture.

Q: I continually hear from HP's competitors that you aren't committed to storage. Is HP serious about storage?

Ann Livermore (A): Thanks for the question. I just finished doing a speech here in Las Vegas in front of 1600 customers and partners, plus many people who joined us via the Webcast. We're introducing nine new products and solutions in the most comprehensive storage announcement our company has ever made. We are very serious about this business. There's nothing more important to HP than enabling our customers to unlock the value of their information.

Q: Will we hear your new CEO talk more about the importance of storage to HP?

Ann Livermore (A): Just last week, Bob Schultz and I spent three hours reviewing our storage business with Mark Hurd. Our new CEO has a great IT and business background and is excited about the contribution that storage makes to HP's overall business.

Q: How involved with these new products was your labs group?

Ann Livermore (A): The HP Labs team, like the HP StorageWorks R&D team, was at the center of all of these announcements. The capabilities that we've already introduced and that we will continue to introduce over the next couple of years for the HP StorageWorks Grid were born in HP Labs.

Q: You used to talk a lot about your strategic Enterprise Network Storage Architecture (ENSA), which really resonated with me. I don't hear you talking about ENSA and I'm not sure I know where HP storage is going.

Bob Schultz (A): The ENSA strategy is alive and well today and embedded in the broader Adaptive Enterprise strategy, which encompasses the entire data center. If you resonated with ENSA, hopefully you'll resonate with the Adaptive Enterprise guiding principles, which include standards-based architectures, simplified management, modular designs for scaling, and virtualized environments with the goal of helping our customers be more agile, get more value, and drive advantages for their business by synchronizing business and IT needs.

Q: It seems like every vendor has iSCSI-based storage but HP has been quiet in that area. What are you doing there?

Mike Feinberg (A): HP has been a leader in IP-based storage both from industry and product perspectives. From the industry perspective, HP has been a leader in the standards bodies including iSCSI ISER specifications. From a product perspective, HP has been delivering IP storage solutions with our bridging technology (storage router SR2122), our NAS products (which have iSCSI capability), and in our XP product family. HP's commitment to IP storage is strong, and we're experienced at helping customers with the delicate transition to new connectivity mechanisms.

Q: Will HP continue to outsource its software intelligence, and what does this mean long-term for HP's internal capabilities?

Frank Harbist (A): HP is not outsourcing our software technology and offerings. Our business model is to embrace industry innovation, drive industry standards in storage (as we have done in servers), and bring innovation to customers in a seamless, easy-to-use manner. In this business model, you see many examples of how we are doing internal development as well as partnering for solution components (including software) to help make this happen. A good example of this is our unified server and storage software framework, where we innovate with the management framework itself (HP Systems Insight Manager-SIM), partner for some solution components (some of the Storage Essentials, some of the ProLiant Essentials), and bring the integrated offering to market with our hardware and services. It's also important to note that this is the most efficient way to bring our customers rich functionality that helps support heterogeneous environments — which HP SIM and the Essentials families do — in a manner that is open and standards-based rather than being a vendor lock-in.

Q: HP seems to OEM quite a bit of storage hardware and software such as the XP technology and Storage Essentials software. Why should I buy storage from you as opposed to, for example, directly from Hitachi or AppIQ?

Frank Harbist (A): In the case of Storage Essentials (SE), what HP is providing is not the same as AppIQ's offering or their OEM partners' products. By August of this year, SE will be tightly integrated with HP Systems Insight Manager (SIM), including a common data repository, single sign-on, common role-based permissions, aligned event reporting and severity classifications, and many more features. At that point, SIM becomes the primary management interface for both servers and storage (and not just HP infrastructure; SIM will also manage heterogeneous platforms). This ability to deliver a unified, efficient framework to manage both storage and servers is unique to HP and cannot be delivered by any of these other companies.

Q: Is this Hitachi stuff or something that was conceived at HP?

Ann Livermore (A): There is a lot of HP-unique innovation in the announcements we're making this week. Whether you look at the enhancements to the EVA, the business continuity and availability solutions, or our ILM services, HP is creating a lot of intellectual property in the storage space. We have over a thousand storage patents. At the same time, Hitachi remains an important partner for HP. Our strategy is to team but also to innovate.

Q: How will HP be utilizing EMC technology?

Frank Harbist (A): There are no current plans to utilize EMC technology in HP offerings beyond the informal interactions we have today in the field. The important things to remember about the EMC lawsuit settlement recently announced are (a) the real winners in the settlement are customers; and (b) this settlement in no way changes the HP StorageWorks or HP ILM strategies. In the future, as we have always done, we will work closely with all industry players, partners and competitors alike, including EMC, to help meet our customers' needs. The good news here is that this settlement removes a barrier that could get in the way of any potential collaboration we might contemplate in the future.

Q: What's the future for storage?

Ann Livermore (A): The future delivery model for storage is quite similar to the overall delivery model for IT. Storage will become much more modular, so that capacity, performance, and resilience can scale based on application requirements. Storage will also become more service-oriented. Both of these capabilities are enabled by our grid architecture.

HP Storage Execution and Investment

Q: What kind of ongoing investment can we expect to see in the future for HP Storage?

Ann Livermore (A): You will continue to see us make substantial investments in our storage business in R&D, marketing, and sales. The HP StorageWorks Grid is an important part of our strategy and an area where HP has unique capabilities.

Q: What does this really mean — the largest storage launch in HP's history?

Duncan Campbell (A): As it relates to HP StorageWorks, it is the largest launch. The measures are based on the number of products and investments. More importantly, the launch serves notice of our intent to compete and win in the storage business.

Q: How much is being invested in this HP StorageWorks launch?

Duncan Campbell (A): The dollars were big but, we felt, necessary to create demand and excitement.

Q: What is your investment in the nine new storage products and services and the expected profit?

Bob Schultz (A): We do not break out specific R&D investments for storage products or provide guidance at the storage business level. What I can say is that HP has grown to #3 in the NAS market over the past few years and we are focused on becoming #2 in the next few years. In tape libraries, we expect to gain the same level of market share in the mid-range and virtual tape market that we have in the overall library market. We ship more SANs than anyone else in the industry. And we expect the EVA to continue to propel our SAN business in the mid-range market.

Q: When will each of the nine new products announced today be generally available for purchase?

Bob Schultz (A): The EVA products started shipping in April; the EFS Clustered Gateway and WAN accelerators will ship this month; and the new tape library and virtual library system will ship in June.

Q: What's the "next big thing" for HP in storage?

Bob Schultz (A): There are a lot of big things for HP StorageWorks today — with the enhanced EVAs, new virtual tape library, new EML tape library, new EFS Clustered Gateway, new EFS WAN Accelerator, new ILM services and many other new products, services, and solutions. We've laid out our vision for the StorageWorks Grid and environment that supports Adaptive Enterprises with a flexible, simplified, virtualized infrastructure. And you'll see our announcements, such as today's, continue to introduce solutions consistent with this vision.

Q: You talked about hiring new storage people last year, but I haven't seen any difference. Did you really follow through on this?

Ann Livermore (A): We have hired a number of storage specialists into our sales organization, and we are not yet done. We see a lot of market demand and need additional resources to cover all of the opportunities.

Q: How do you account for HP's 30% market share loss in mid-tier storage over the last few years?

Ann Livermore (A): You didn't buy enough! Seriously, over the past year we did not have adequate sales coverage to pursue the business opportunities that were available. We also have refreshed our entire product line and expanded our services offerings and capabilities. We are now very excited about what we can make happen in the marketplace.

Q: Are there any plans for delivering the solutions announced today in Latin America?

Thomas Goepel (A): The solutions and the services will be available around the globe. For the ILM services there is a staged roll-out plan; the services are available as of today in the US, UK, and Australia and will be rolled out to the other countries over the next 6 months. For customers in Latin America, special arrangements can be made to deliver them today.

Adaptive Enterprise

Q: I haven't heard much about your Adaptive Enterprise initiative lately. What are the key programs that could positively impact my business?

Ann Livermore (A): We are working with many of our customers today to help them build a more Adaptive Enterprise. This is not a part number that you can order, but instead a journey to better synchronize IT and business. Whether you're working on consolidation, continuity, compliance requirements, or management control, you are building a more Adaptive Enterprise.

Q: What have been and will be your areas of greatest success for Adaptive Enterprise? I.e., where do you see consolidation and where do you see growth?

Ann Livermore (A): Storage consolidation is one of the most popular consulting services that HP offers. It's the first step that many of our customers take on the path to simplifying and standardizing their infrastructure. Our biggest success with the Adaptive Enterprise is helping customers unlock the value of their information.

Q: What does the Adaptive Enterprise mean for how we will be using storage in the future?

Ann Livermore (A): The Adaptive Enterprise has four main design principles: simplification, standardization, virtualization, and integration. This is a direct reflection of what most of our customers are trying to do with their storage infrastructures. The HP StorageWorks Grid enables you to pool storage resources to scale capacity based on application demands.

Q: How do you compare your Adaptive Enterprise play in storage with IBM's On Demand?

Ann Livermore (A): HP's Adaptive Enterprise is all about HP teaming with our customers to help them reduce costs, improve service levels, manage risk, and become more adaptive to change. We think it's far different and much better than what our competition offers.

HP StorageWorks Grid

Q: I don't understand your grid architecture vision.

Mike Feinberg (A): The grid architecture vision is pretty simple. It is based on a number of tenets: 1. Scale-out architecture: The architecture is designed to scale performance and connectivity as we scale capacity. This eliminates the bottlenecks that occur in many of today's storage architectures. 2. It is managed as a single system image: Today, as capacity is deployed, management complexity is increased because administrators need to manage additional discrete devices. For example, the deployment of a new modular array requires management of another physical box. Operational tasks such as firmware download have to be implemented on another entity. In the StorageWorks Grid, by contrast, a single system management paradigm exists. As new smart cells are added (increasing capacity, computing, and connectivity), they become part of the grid. The grid manages the cells as one "virtual entity," so you have one firmware download, as opposed to multiple downloads. This eliminates many of the complexities inherent in network-based storage. 3. It is built on industry-standard components: HP is a significant player in the industry. By utilizing our volume capabilities, we are able to deploy solutions with a capital structure that is second to none. These tenets are embodied in today's solutions such as our Reference Information Storage System (RISS) and the EFS Clustered Gateway.

As we look forward to the future of the StorageWorks grid, we'll see the following tenets embodied: 4. Dynamic repurposing: Today our grid solutions are single-focused solutions that make it difficult to redeploy capital hardware purchases for new purposes. In the grid, services (such as archive, file, array) will be dynamically loaded and reconfigurable. This allows hardware to be deployed once and repurposed based on varying needs. 5. Co-location: The grid will allow the co-location of services on a single physical platform. Complementing the "reconfiguration" capability, co-location allows you to efficiently utilize your physical resources to deploy storage services. An example of a solution that provides this co-location today is in our NAS solutions, which can deliver both block (iSCSI) and file (NFS/CIFS) storage on the same physical device. 6. Heterogeneous capacity utilization: the ability to have today's capacity sit and be utilized in the grid architecture. The grid provides incredible flexibility to deploy just-in-time storage services, managed in an operationally efficient manner.

Q: Are any pricing details available for the StorageWorks Grid?

Mike Feinberg (A): Today solutions based on the StorageWorks Grid architecture — Reference Information Storage System (RISS), Clustered Gateway, and Scalable File Share (SFS) — are available at competitive pricing. As additional solutions based on the grid become available, pricing will be communicated.

Q: What is the least-expensive solution in the StorageWorks Grid?

Mike Feinberg (A): The StorageWorks Grid is an architecture to develop and deliver industry-leading storage solutions based on industry-standard technologies. Today the Clustered Gateway represents an industry-leading NFS NAS platform built on industry-standard servers delivered in a scale-out architecture managed as a single system. This solution delivers leadership price/performance.

Information Lifecycle Management (ILM)

Q: ILM seems to be an over-used phrase these days. Is it a bunch of hype or is HP doing something in this space?

Frank Harbist (A): ILM is such a broad topic that it's not a surprise that people like yourself draw conclusions about "hype." We've tried to avoid that and focus instead on the real technologies that we can bring to market to help our customers solve real problems today. That's why, although we have a very broad ILM strategy that focuses on helping customers protect, optimize, and preserve their information assets, the products we have brought to market have been focused on discrete problems in application spaces that represent the biggest current pain points. For example, our Reference Information Storage System (RISS) delivers a cost-effective compliance solution for managing email, but in the process also provides an intelligent email repository that can be full-text searched (including attachments) so that you can not just store your information but find what you're looking for. You can see more on our ILM strategy and offerings at www.hp.com/go/ilm

Q: As the Reference Information Storage System (RISS) extends HP's presence into Microsoft Exchange along with the new ILM service offerings, is there any other ILM-based solution HP is developing towards specifically addressing how to support a CRM environment or a vertical segment like healthcare?

Frank Harbist (A): We have an extremely broad ILM strategy that is focused on applications as well as vertical markets. You can learn more about what we are doing in ILM at www.hp.com/go/ilm. RISS is an intelligent repository that has rich application awareness, today focused on email and office documents. Our roadmap with RISS does provide for additional application connectivity, including databases and CRM. Look for more here in the next several months.

Q: Storage and backup are typically overhead tasks, necessary fail-safes, but not direct value added. How do you see storage becoming a strategic task – perhaps along dimensions other than real time – e.g., searching offline databases? I'm very interested in ILM and its cultural effects.

Ann Livermore (A): The real power of storage is when you can put your information to work. ILM is a great example of this. Quite often people think of ILM as an answer to compliance or regulatory issues. That certainly is true. But it's a lot more powerful than just that. The ability to use information to open up new revenue sources or satisfy customers in new ways clearly unlocks the business value of information.

Q: I only heard a little about the new ILM services you're offering. Care to comment about the services capabilities in this launch?

Thomas Goepel (A): With our new services HP is addressing the pressing needs of our customers to gain more value out of the information they store in their enterprise. The new service offerings will help them chart a strategy for how to use information, how to manage information, and how to determine what value information provides for the enterprise. Combined with HP's industry knowledge, the services will address specific business needs. More details about the services can be found at <http://h20219.www2.hp.com/services/cache/125954-0-0-225-121.html>

HP StorageWorks Enterprise File Services (EFS) Clustered Gateway

Q: How is your clustered file system different from competitors'?

Harry Baeverstad (A): Our clustered file system is fully symmetrical — which means that all nodes in the cluster serve the entire file system. Our competitors need to isolate file systems to individual nodes in the cluster, so you don't really get the benefits of capacity and performance scaling for a given file system (unless you break up the file system manually across nodes). We also transparently add nodes and failover nodes, since every node in the cluster sees the whole file system.

Q: How is backup with the EFS Clustered Gateway handled?

Harry Baeverstad (A): We have a very cool solution for this! The EFS Clustered Gateway has a fully symmetrical global file system with transparent failover. So you can choose to failover one node in the cluster – it takes less than 5 seconds – and run your favorite Linux-based backup application on that node to backup the file system. Once backup is complete, you bring the node back online.

Q: A couple of questions concerning your disk-based global file system with single name space product: 1) Product name and model? 2) ProLiant based? 3) HP home-grown or an OEM? 4) Access via CIFS and NFS (NFS-like)? 5) Scalable network connectivity: Bob mentioned 3GB (per sec)? 5) Maximum disk capacity supported?

Harry Baeverstad (A): The product we are announcing is the Enterprise File Services Clustered Gateway. It has a global, fully symmetrical file system across all nodes in the cluster (<http://h18006.www1.hp.com/storage/efs.html>). It is based on the ProLiant DL380 model. The solution is integrated and developed by HP, but has an underlying clustered file-system based on an engine from PolyServe. It supports scalable NFS and CIFS via SAMBA. Each node has dual GB NICs; however, one port is used for internode communication. On performance: a 16-node cluster can deliver nearly 3GB read-write throughput (2.8 GB/sec to be exact). Capacity is capped at 8.2 GB.

Q: Great Announcement! HP has been offering a NAS solution based on Lustre. How does this compare with your new Enterprise NAS offering?

Harry Baeverstad (A): HP has a very high-end files serving solution called SFS - or Scalable File Share, based on Lustre technology. We position the SFS solution for extremely high-performance file serving needs. This solution scales to thousands of nodes. Our EFS Clustered Gateway is targeted at scaling from 2 nodes to 16, to meet the more common requirements of our enterprise customers at very attractive price-points.

Q: How do you intend to compete against Network Appliance's products, which are established and well accepted?

Harry Baeverstad (A): Network Appliance has offered proprietary high-performance standalone NFS NAS systems for many years. But customers' needs are changing: they need better scalability in performance and capacity; they need the price benefits of industry-standard technology; and they need to grow their storage as their requirements expand. HP's new EFS Clustered Gateway addresses all of these issues in ways that our competitors cannot: it delivers scalable high performance at very low prices — about 1/2 to 1/3 the cost of our competitors' offerings.

Q: You talk about a new clustered file system used in your new NAS gateway. Is this from Microsoft or HP?

Harry Baeverstad (A): As Bob mentioned in his keynote, we partner with best-in-class technology partners. Our EFS Clustered Gateway product uses an underlying clustered file system engine from a partner of HP's named PolyServe

Q: Is a performance white paper available for your EFS Clustered Gateway?

Harry Baeverstad (A): We have one in progress. Check back at our Website:
<http://h18006.www1.hp.com/storage/efs.html>

HP StorageWorks EFS WAN Accelerator

Q: I'm not clear on how HP's WAN Accelerator increases performance. Tell me more please.

Harry Baeverstad (A): The WAN Accelerator incorporates a whole bunch of technologies that provide the acceleration performance including: compression, TCP optimization, transaction prediction, data block chunking algorithms, chatty transaction reduction, redundant block elimination. Check out this Website for the white papers:
<http://h18006.www1.hp.com/storage/efswhitepapers.html>

Q: What's different between HP's EFS WAN Accelerator and compression appliances?

Harry Baeverstad (A): The difference is significant! HP's WAN accelerator provides compression as well as TCP optimization and large-packet sizing, transaction prediction, redundant block reduction, and application specific acceleration for files, email, web, etc. Check out this Website for more details:
<http://h18006.www1.hp.com/storage/efswhitepapers.html>

Q: Please compare your WAN Accelerator branch office functionality with the solutions announced by EMC and Cisco.

Harry Baeverstad (A): Great question! The EFS WAN Accelerator accelerates files, email and Web traffic as well as optimizing overall TCP traffic. Our competitors' offerings are focused on accelerating files only.

HP StorageWorks 6000 Virtual Library System

Q: What are the disks behind the Virtual Library System and can I use existing disks that I already have?

Rick Luttrall (A): We are using Modular Smart Array (MSA) Technology behind the VLS and you can use your existing MSA; however, you will need to purchase a license for each JBOD.

Q: Can I use non-HP disk subsystems behind the Virtual Library System?

Rick Luttrall (A): No, only HP MSA systems are supported.

Q: Is the virtual tape technology HP's or does it come from a third party like FalconStor?

Rick Luttrall (A): Yes, we partnered with a third-party developer for our unique version, but our offering will be more than a software solution as we have architected and optimized it to provide maximum performance.

HP StorageWorks 4000, 6000, and 8000 Enterprise Virtual Arrays

Q: It's been nearly three years since there was a major refresh of the EVA. Why did it take so long?

Kyle Fitze (A): When introduced in late 2001, the EVA was the first virtual array on the market. Its architecture was so advanced that it maintained leadership in performance and simplicity while other competitors scrambled to catch up. We've seen many firsts since its introduction, including; synch and asynch replication, advanced data replication for HP-UX and Windows environments, the first array to incorporate FATA drive technology, etc. So while it's true that we have taken three years to upgrade the hardware architecture, we've focused on value-added solutions capabilities and management simplicity that lead the industry.

Q: What is the difference between the current StorageWorks EVAs and the new EVAs?

Kyle Fitze (A): Updated controller architecture, new processors, more host ports, more cache. We've also introduced a new model that fits between the entry-level 56 drive and high-end 240 drive arrays. In short, we offer higher performance, more scalability, more choice with three models. In addition, we offer new management capabilities with Command View CV EVA and the Replication Solutions Manager. We've also tuned the arrays for business continuity and availability solutions with capabilities like pre-allocated Snapclones. Please check out our storage Website for more information: <http://h18006.www1.hp.com/storage/arrayssystems.html>

Q: Has the virtualization changed on the EVA? How would you recommend mixing two applications like Exchange and SQL in the EVA in terms of data layout?

Kyle Fitze (A): The virtualization capabilities of the EVA4000, 6000, and 8000 are the same as those of the EVA3000 and 5000, with the addition of simplified management features for performance and replication. Best practices for data layout depend on your requirements for performance, availability, capacity utilization, etc. Please contact your HP storage architect for more help in this area, or you can scan our white papers at the new Microsoft storage portal: <http://h18006.www1.hp.com/storage/osmswindows.html>

Q: Do you have real-world application performance test results for the new EVA?

Kyle Fitze (A): Unlike some of our competitors, we do publish application performance data as well as participate in third-party performance benchmarking from SPC. We are in the process of completing these for the new arrays that began shipping this past month. Please check back at the StorageWorks Website for additional white papers and performance data as they become available: <http://h18006.www1.hp.com/storage/arraywhitepapers.html>

Q: When will iSCSI be available on the EVA?

Kyle Fitze (A): We offer NAS and SAN integrated solutions for iSCSI with the EVA today. These solve more of the customer problem than just the cost of the switch infrastructure. They provide multi-protocol (FC & IP) capability, file and block consolidation, simplified management, and affordability (since the Command View software can be run on the NAS gateway). We plan to introduce native iSCSI array connectivity with the EVA later this year.

Q: How much do the EVA 4000, 6000, and 8000 models cost in typical configurations, and how does that compare to competitive products from EMC and IBM?

Kyle Fitze (A): The EVA 4000, 6000 and 8000 are priced very competitively to EMC's CX300, 500, and 700. In addition, we will continue to cost-reduce and simplify entry-level SAN configurations with our EVA3000 Starter Kits. Please contact your sales representative for more specific solution pricing information.

Q: What is the upgrade process to the new EVA? Is it forklift?

Kyle Fitze (A): To upgrade from the EVA3000/5000 to the new EVAs requires a controller upgrade and in some cases an upgrade of the back-end switches. HP will offer services and tools to assist in this transition. More information can be obtained from your sales representative or at <http://h18006.www1.hp.com/storage/arraysystems.html>

Q: Please detail the integration of the grid concept with EVA5000.

Mike Feinberg (A): The StorageWorks Grid will provide solid investment protection. Customers who invest in our EVA will be able to roll their capacity and capabilities forward because the grid will "front-end" this technology with a smart cell whose capacity is delivered by the EVA. The grid enables you to deploy solutions today and utilize those solutions in future architectures.

HP StorageWorks Enterprise Modular Library E-Series

Q: I'm aware of the MSL and ESL tape libraries. Does the Enterprise Modular Library (EML) replace one of these?

Rick Luttrall (A): No, the EML series is a natural fit between ESL and MSL. It offers enterprise-class features that scale from 103 cartridges to up to 500 within the same rack. The EML picks up where the MSL leaves off and grows to the entry level of ESL.

Q: I know the tape libraries say HP on the front, but who is your partner?

Rick Luttrall (A): We have many partners for tape products. For the new Enterprise Modular Library (EML) we are working with STK in a joint development. We worked with STK on the sheet metal and the robotics, while our own R&D organization developed the intelligent controller called Enterprise Tape Library Architecture (ETLA) and the tape drives.

HP Storage Essentials

Q: You mentioned Storage Essentials. How does that fit in with HP SIM and the OpenView family going forward?

Frank Harbist (A): Today, Storage Essentials (SE) is lightly integrated with HP SIM, being launchable in frame from the SIM console. By August of this year, SE will be tightly integrated with SIM, including a common repository, single sign-on, common role-based permissions, aligned event reporting and severity classifications, and many, many more features. At that point, SIM becomes the primary management interface for both servers and storage (not just HP infrastructure; SIM will also manage heterogeneous platforms). SIM, in turn, integrates into higher-order management frameworks, such as OpenView and others. So infrastructure management feeds into the broader application, IT services, and business management frameworks that OpenView manages. We are taking a holistic view of HP's software stack and driving these products in a very integrated fashion. This helps deliver the value proposition for holistic management of HP's Adaptive Enterprise.

Storage Virtualization

Q: Can you explain HP's storage virtualization strategy?

Mike Feinberg (A): HP is the only major technology provider to provide virtualized storage and does so in an array. Virtualization is a technology that allows customers to simplify their management and increase the efficiency of their operation. As such, HP believes that virtualization technology will be delivered in a multitude of computing locations including the host, network, and of course the end physical devices of the array. The key for HP is to

deliver these solutions in a manner that simplifies customer experiences, not in a manner that increases operational complexity. In looking to HP, customers should focus on this simplification and HP will deliver the appropriate technology in the appropriate location to create the desired solution.

Q: Will HP offer storage network virtualization, or will you leave it to partners?

Mike Feinberg (A): HP continues to deliver best-in-class storage virtualization solutions that reduce operational complexities by eliminating tasks and automating processes. Our virtualization solutions represent a high barrier to entry for competing architectures. As we go forward, we envision the utilization of virtualization technologies in a multitude of computing locations including host, network, grid, and end-device.

Q: How is your in-band virtualization technology better than EMC's out-of-band Invista architecture?

Mike Feinberg (A): HP has been delivering virtualized storage for at least five years. In these solutions, we have focused on reducing the operational complexity of delivering storage services. The virtualization of our EVA eliminates complexities of data placement layout, automated use of capacity, and performance-aligned protection. We feel this presents an extremely high barrier to entry for any competitive solution.

Q: What has HP done to implement virtualization of storage in its own data centers? What cost benefits have you seen so far?

Mike Feinberg (A): In the spirit of aggressively utilizing best practices, HP IT employs our storage technology such as XP, EVA, etc. These solutions provide an industrial-strength, mission-critical storage environment that keeps a 150,000+ person company operating at peak performance. The virtualization technologies simplify IT by pooling resources, automating operational tasks such as provisioning, and providing an industry-leading performance environment.

Operating System Support

Q: How does all of this integrate with OpenVMS?

Mike Feinberg (A): OpenVMS is one of our mainstream operating systems, so products such as our array family including EVA products support and will continue to support OpenVMS.

Q: Will all new storage still be qualified and supported on Alpha-based systems? Or will I have to migrate off my EVAs?

Kyle Fitze (A): The new EVAs will support OpenVMS and Tru64 UNIX operating systems. We also will support HP-UX. So the EVA will provide support to help you through the transition from Alpha to Integrity or PA. More information on OS support can be found at <http://h18006.www1.hp.com/storage/array systems.html>

Q: Why are some StorageWorks products qualified last with OpenVMS, and with other non-HP operating systems like Linux or Windows first?

Duncan Campbell (A): It has to do with the most pressing business case. We support multiple operating systems but hit the ones that have the largest customer need first.

Q: The EVA Starter Kit includes free SecurePath licenses. I only run OpenVMS, which has multi-pathing built into it. I am not interested in these licenses, and I don't see why I should have to subsidize Windows /Linux/Solaris users. So recently when I wanted to get more storage (I already have 2 EVA 5000's), I got a couple of EMC Clariions instead. Are there any plans to stop forcing users of operating systems like OpenVMS to subsidize users of these inferior operating systems?

Kyle Fitze (A): The intent of the EVA3000 Starter Kit was to reduce the deployment costs for OS's that required all the components in the kit. We do offer the same products in non-bundled configurations for those who don't need all the multi-pathing licenses.

Q: At present, HP products are being certified for Microsoft networks upon release. With more and more interest in Linux, why can't these products be released as Linux-certified? And how long after release should we expect for other operating systems such as NetWare to be certified?

Kyle Fitze (A): Our EVA arrays support HP-UX, Linux, Windows, OpenVMS, Tru64 UNIX, NetWare, AIX, Solaris, VMWare, etc. Please see our website at <http://h18006.www1.hp.com/storage/array systems.html> for more specific OS support information.

Q: Are all of the products you mentioned today supported on SuSe Linux Enterprise Server (SLES) version 8 and 9?

Harry Baeverstad (A): The EFS Clustered Gateway is based on SuSe v9. The EFS WAN accelerator is a private distribution.

File System Extender

Q: I want to be able to move data seamlessly and virtually between MSA, EVA, and XP. When is this going to be addressed?

Mike Feinberg (A): Today, we offer File System Extender (FSE), a product that seamlessly moves files from one storage platform (array-based) to another.

SAN vs. NAS

Q: I am the Systems Administrator at a residential high school and have really been struggling with figuring out which storage solution is right for our organization and budget. How do any of the new offerings clear up the complexities of SAN vs. NAS and address budget constraints (for educational institutions especially)?

Harry Baeverstad (A): This is a great question! Many people are confused about the value proposition between NAS and SAN and which is best for their business mission. SANs are great solutions when you have mission-critical, high-availability requirements that include sharing storage across many application servers for block-based applications, e.g., databases like Oracle, SAP, PeopleSoft. A NAS file-serving gateway can be added to the SAN to provide file services; HP has been driving NAS/SAN fusion for over 4 years. NAS is a great choice when your needs are less complex and you have a primary mission to serve files to your user community. NAS is much easier to manage and less costly. Additionally, you can add iSCSI capability to the NAS environment to serve data blocks for your block-based applications. Hope this helps.

Storage Solutions

Q: What partnerships do you have with data warehousing companies that produce business intelligence?

Rusty Smith (A): We work with a number of partners for BI solutions, including most of our database partners: Oracle, Microsoft, Sybase, etc. For more information, please visit <http://h71028.www7.hp.com/enterprise/cache/3905-0-0-225-121.html>

Q: Tell me more about your medical archive solution. What is that all about?

Frank Harbist (A): There is a wealth of information on our Medical Archive Solution (MAS) at <http://h18006.www1.hp.com/products/storageworks/medicalarchive/index.html>. Alternatively, you can go to www.hp.com/go/ilm and explore our full set of ILM solutions. At the latter site, you can navigate through application-aware ILM solutions to find what we are doing in healthcare.

Q: Do you have any solutions specific to manufacturing — e.g., management of RFID info?

A: We have several solutions for manufacturing, including automotive, life sciences, oil and gas, aerospace, utilities, and others. Check out www.hp.com/go/manufacturing to see these described. Near the bottom on this page are links to some solutions, white papers, and videos for RFID.

Q: I don't believe SPC is "real world." What about Exchange or Oracle environments?

Kyle Fitze (A): The good news is that we've tested those too. You might have heard Bob reference the great results we had on the new EVAs running Oracle. Please check our storage application solutions Website for this information as it becomes available: <http://h18006.www1.hp.com/storage/solutions/storagesolutions.html>

Q: I need to consolidate my storage. Where do I start and how do I determine what will have the biggest impact?

Rusty Smith (A): If you visit www.hp.com/go/itconsolidation, there is a section labeled "IT Consolidation Journey." This will give you a good foundation for thinking about how to start. In addition, HP offers services to help you embark on this journey; you can link to them from the same page.

Q: If you are serious about storage, have you linked up with NCR, which is the largest provider of data warehousing and sells a ton of storage?

Mike Feinberg (A): HP partners with a number of technology providers that aggressively deploy storage. The list of partners is continuously reviewed and ever-expanding.

Small & Medium Business

Q: We have offices worldwide, some as small as 2-3 people, with one or two PC's and their information stored on those PC's; regional offices with up to 100 seats with a LAN and possibly a tape backup in place; and a world headquarters with over 1,000 seats and a SAN in place. I'm unsure how your solutions could assist me in creating a worldwide SAN.

Rusty Smith (A): This sounds like an excellent opportunity to look into some IT consolidation solutions. One area of this is remote office consolidation. Go to www.hp.com/go/itconsolidation for more information. One of the solutions we announced today is our WAN Accelerator, which specifically addresses this problem. It is based on our NAS products and allows small remote offices to access the SAN without having to have SAN infrastructure at the remote site. You should be able to link to these solutions at www.hp.com/go/storageworks2005

Q: Much of what I heard on the Webcast sounded geared to large business. As a small-business owner, how can I find out more how these new products can help me?

Bob Schultz (A): As a small-business owner, you are a major focus of HP StorageWorks efforts through our Simply StorageWorks program. Let me highlight a few items to look at: (1) The MSA 1000 Small Business Kit is a SAN designed for small businesses. We significantly simplified the installation steps. It uses the same disk drives as the ProLiant servers to lower your costs, and its management is consistent with Smart Arrays in your servers. (2) ProLiant Storage Servers have also won awards for simplicity of installation and operation. Last November, we introduced the Application Software Manager to ease installation and set-up of a NAS platform in an Exchange environment. We took 6 GUI's with over 29 steps and boiled it all down to 4 straightforward questions. No one else has provided this level of value-added ease on NAS platforms for small and medium businesses. (3) Finally, we're integrating server and storage management. This means that you can manage your server and storage with the same basic tool: HP's Systems Insight Manager, which comes free with servers and storage. This is just a "short list," but I hope it shows that we are focused on your needs. You'll see more announcements on the MSA, NAS, and data protection for you in the coming months.

HP StorageWorks XP Array Family

Q: Does the XP line have a robust future?

Bob Schultz (A): Yes. XP is a core part of our storage portfolio. The XP line was refreshed last September with the introduction of the new XP12000. We recently added support for XP on NonStop platforms. We've been enhancing and extending the XP12000 this year with new software capabilities. You'll continue to see more enhancements as we move into the future.

HP StorageWorks Modular Smart Array

Q: Will the lower-cost MSA1000 and MSA1500 be updated to Ultra320 or SAS?

Kyle Fitze (A): The long-term plans for the MSA family will be to transition to SAS along with our ProLiant servers. The benefit to customers is that we can preserve the direct attached storage (DAS) to SAN migration capabilities.

Partnerships and Alliances

Q: You spoke highly of both Brocade and Cisco. Which should I use for my SAN switch needs?

Bob Schultz (A): We'll be happy to work with you on your choice. Both Brocade and Cisco are strong partners of HP StorageWorks, and the choice really depends on your current environment and future needs.

Q: I heard that Cisco was there with you at the event. Can you comment on anything new you're doing with them in storage?

Bob Schultz (A): Cisco is a key partner for HP not only in storage but in other areas. There was no announcement today, but you'll see us continue to work with Cisco on enhancing and extending storage networking capabilities..

Q: What are HP's plans for the future with respect to Hitachi?

Ann Livermore (A): Hitachi is an important partner for HP. We are very pleased with the product development and marketing relationship we have with them. Between HP and Hitachi, our goal is to ensure a very broad market coverage.

Information Resources

Q: Will participants be receiving a complete copy of this Q&A session? Also, how do we get a copy of today's presentation?

Ann Livermore (A): We will post a full transcript of the Q&A session at the Webcast site. In addition, a replay of the Webcast will be available here for at least the next two months.

Q: Where can I find more information about what was discussed during the Webcast?

Duncan Campbell (A): At the bottom of the event screen in the "What's New" section are links to all the products and services announced today. Check "Next Steps" if you want HP to contact you directly.

Q: As a channel partner, it's great to have access to executives to ask these questions. How can we get more access to this type of information?

Duncan Campbell (A): Our Solution Partners Organization (SPO) is the best place to start. They can vector you into the HP organization for the content and contacts you need. Also check out our new HP StorageWorks Web page: <http://h18006.www1.hp.com/storage/highlights/05162005.html>

Q: I'd like to hear more from other customers about their implementations but I can't be there in person. Any

thoughts?

Duncan Campbell (A): I would suggest checking out our HP StorageWorks Web page: www.hp.com/go/storageworks. Under the Spotlight heading on the right hand-side of the page there is a link for Customer References. You'll find some good stuff there. You can also ask your local HP or Channel rep

Portfolio Integration and leverage

Q: Are any of your storage offerings specifically geared to integrate with and address the needs of blade servers?

Kyle Fitze (A): We support our full line of ProLiant BladeSystem offerings. You also heard today about our latest integration of FC fabric switching into our Blade environment, making deployment and management even simpler and more affordable. Please check our Website for more specific information about BladeSystem server support: <http://welcome.hp.com/country/us/en/prodserv/storage.html>. Coming soon, we'll post a Web page that details all of our blade server support and connectivity solutions.

Q: I have an environment that cannot be down, ever. What does HP offer to ensure my systems stay up?

Ann Livermore (A): One of HP's key investment areas for the past 15 years has been high availability, whether you look at our Integrity servers, NonStop servers, or XP storage solutions. We also know that availability is a combination of process, people, and technology. Our services teams can offer process expertise or education services, in addition to the great technology that we have.

Q: Frankly, I haven't seen much beyond your storage capabilities. How can you make it easier for me to work with you?

Ann Livermore (A): One of the things we want to be able to do is give our customers easy access to the full range of products and services in our portfolio. We are always trying to get the right balance of specialists who are very deep in an area of expertise, but also make available to you other resources based on your business needs. Perhaps a good step would be to share with our storage specialists the other needs and areas of interest you have; then they can line up those resources to speak with you.

Participant Feedback

Q: Are HP's executives actually answering these questions?

Ann Livermore (A): I'm sitting in a room right now next to Bob, pounding away on the keyboard. I like to stay directly connected to our customers and see their reaction to our products and services. This is a great way to do that.

Q: Ann, care to tell us what you think about your new boss?

Ann Livermore (A): I love every boss I've ever had! Seriously, Mark Hurd is a great CEO for HP. He has a broad and deep understanding of the technology industry and our customers' most critical needs. He has already done "deep dives" reviewing our businesses and what we need to do to deliver the full value of our portfolio to our customers. The employee and customer reaction to Mark has been very positive.

Q: Great event. Thanks HP!

Ann Livermore (A): Thanks for joining us. These Web chats are a really great opportunity for me and my team to interact with hundreds of customers.