WHAT HAPPENS IN VEGAS:
Storage magazine reports from CES 2015

TECHNOLOGY:
Hyper-converged storage

INTERVIEWS:
Quantum, Fujifilm, Toshiba

FLASH ARRAYS:
The good, the bad and the ugly

DATA RECOVERY:
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COMMENT

ONCE IN A LIFETIME

By David Tyler
Editor

How long is a lifetime, exactly? I don’t mean the traditional three-score years and ten that we all aspire to, rather the lifetime of a piece of data - or perhaps more importantly, the lifetime of the medium that data is stored on.

Optical disk manufacturers Verbatim have just announced a new high capacity Blu-ray disk, the 100GB M-DISC, developed by Millenniata. With four times the capacity of a standard Blu-ray (and over 20 times that of a DVD), there is sure to be demand for these new disks from business users as well as consumers. And while some competitive technologies offer higher capacity, can any offer the durability of optical disk?

According to Verbatim, the new media offers ‘archival storage life’ of over 1,000 years. In fact, tested according to the established ISO/IEC 16963 (2nd edition) standard, the outcome was a remarkable average lifetime of significantly more than 2,000 years with no more than one failure per 100,000 discs expected, after more than 1,000 years at 250C (770F) and 50% relative humidity. Overkill? Maybe not.

We have often discussed in these pages the need to consider the potential obsolescence not just of media but of the devices that can read them: if you have any business-critical data still stored on 5.25” floppy disks, you’d better hope your local PC supplier has a large warehouse of outdated drives! But it is important to think ahead even if using relatively modern media such as LTO tape.

This issue features a catch-up with Fujifilm’s Roger Moore, who last year explained to us the benefits of their newly launched d:ternity archive service. As Roger says: “We’ve now launched LTO6, which will read and write LTO5 tapes. However with LTO4 tapes, it is limited to read-only. So for anyone wanting to migrate to LTO6, if they have an existing population of LTO3 tapes they can’t be read. Some of our clients have tens of thousands of tapes - in the case of some financial institutions even hundreds of thousands - archived away. Their problem is that they have to retain and maintain old legacy hardware and software - and even then they will probably still have to regularly convert to new software versions. This can make it difficult for any business to predict the total cost of archiving and data storage for its data centres.”

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Toshiba has added 6TB SATA and SAS models to its MG04 series of 3.5-inch form factor enterprise capacity class of hard disk drives (HDD). The new SAS interface models provide the benefits of 12Gbit/s SAS transfer rates and enhanced power management features for seamless integration with the latest generation of data center infrastructure. The MG04 series is specifically designed for midline and nearline business critical workloads.

The new MG04 series 6TB models offer a 50 per cent increase in max capacity from prior MG03 generation 4TB models and a 30 per cent increase in sustained data rate. These enterprise HDDs support both industry-standard 4K native and 512e Advanced Format sector technologies for optimum performance in the latest generation servers and storage systems. Emulated 512e Advanced Format sector technology performs best in legacy applications requiring 512 sector lengths using aligned-write environments.

“these additions to the MG04 series deliver an impressive 6TB capacity and continue to provide the benefits of Toshiba’s persistent write cache technology to enhance performance for business critical server and storage systems,” said Martin Larsson, VP, Toshiba Electronics Europe, Storage Products Division.

www.toshiba.semicon-storage.com

6TB ENTERPRISE CAPACITY HDDS

THE INTELLIGENT STORAGE ELEMENT

X-IO Technologies has announced a major update to its storage technology that will underpin X-IO’s expanding portfolio whilst delivering all flash array performance and operational simplicity with the capacity availability of traditional storage.

Gavin McLaughlin, VP of worldwide marketing for X-IO Technologies, said: “This is another important step forward in our successful vision to help customers resolve the three key challenges of storage: 100% performance at 100% capacity utilisation, reliability without operational overhead, and the industry’s leading balance of cost, capacity, performance and risk.”

X-IO designed the new ISE G3 solutions for heavier workloads from media and other applications in database, virtualised and cloud environments, which demand more performance, more connectivity and operational simplicity from storage.

Randy Kerns, senior strategist and analyst at the Evaluator Group, said: “X-IO’s latest product expansion offers a compelling total cost of ownership model that factors the best of both flash and spinning media. Enterprises are increasingly focusing on the value of a ‘guaranteed lifespan’ to reduce overall cost and risk and deliver the greatest possible return on their storage investments.”

Bill Kleyman, director of strategy and innovation at MTM Technologies, an X-IO partner, concurred: “Many organisations are looking for a new way to control the vast amount of data that cloud, IoT, and other applications are creating. Underpinning these organisations are data centres that are trying to make their environment more efficient whilst also continuously improving the experience of the end-user. By diversifying their storage offering, X-IO can really impact a number of new use-cases including virtual application delivery, cloud-based workloads, and even big data.”

www.xiastorage.com

FLEX APPEAL

QLogic’s FlexSuite technology is the exclusive 1Gbit Gen 5 Fibre Channel connectivity solution for Huawei OceanStor storage systems. The addition of QLogic Gen 5 connectivity enables Huawei customers to deploy end-to-end Gen 5 SANs in combination with Huawei RH Series rack servers and X Series data center servers, also powered by QLogic FlexSuite technology. Continued collaboration between...”

“Huawei offers a diverse portfolio of OceanStor solutions that provides high-performance, highly reliable and scalable storage for high-availability clustering, big data and cloud storage environments,” said Fan Ruiqi, president of Huawei Storage Product Line. “With end-to-end Gen 5 Fibre Channel connectivity from QLogic, we can deliver high bandwidth server and storage networking solutions that can meet the demanding requirements of performance-intensive applications in today’s enterprise.”

www.qlogic.com

VIRTUAL SUPPORT

Seagate’s Enterprise Performance 15K HDD and its 1200 SSD 12Gb/s SAS drives have been certified by VMware as interoperable storage tiers for VMware Virtual SAN. An industry first, Seagate 12Gb/s hard disk drives (HDD) and solid state drives (SSD) now support Virtual SAN for VMware vSphere, a new hypervisor-converged storage platform, delivering the benefits of faster, more reliable and cost-effective shared data for traditional data centres and emerging cloud infrastructures.

“We congratulate Seagate for obtaining VMware Virtual SAN certification,” said Gaetan Castelein, senior director, storage and availability, VMware. “We look forward to continuing our work with Seagate to deliver 12Gb/s technology that provides efficient, reliable and scalable solutions for customers.”

www.seagate.com
Reliable data storage is the lifeblood of any enterprise. So why trust your data to anything less than the most trusted, most reliable drives from the most experienced manufacturer? Toshiba invented NAND flash storage, and have millions of drives installed worldwide. From HDDs to SSDs, and 3.5" to 2.5", when you need high-capacity, high-performance storage solutions for the heart of your enterprise, your head says Toshiba.

For more information visit www.storage.toshiba.eu
S3 ACQUISITION

Capita IT Enterprise Services has purchased data storage specialist Solid State Solutions Ltd (S3). S3 is based in Basingstoke, Hampshire, which is BIL3 and List X accredited. Additional services offered to clients include big data analytics, data protection software and off premise managed solutions including back up as a service. The company has 30 staff with more than 300 regular customers from the private and public sector with an increasing number of blue chip clients. The business will sit within Capita IT Enterprise Services’ technology solutions division.

www.capita-ites.co.uk

CLARANET INVESTS IN HP SSD ARRAYS

Claranet has completed a major investment in its storage capabilities, furnishing its storage services with Solid State arrays from HP. The company has invested over £1 million into a new shared storage platform across three of its data centres, introducing a three-tiered model of storage. Each tier will have a guaranteed Quality of Service in terms of Input/Output Operations Per Second (IOPS). Both the standard and the premium tiers will be delivered from 100 per cent Solid State Drives from HP 3PAR arrays, providing a cutting edge platform available on a pay-as-you-grow per GB/Month model.

Commenting on the investment, Neil Thomas, Claranet’s Product Director, said: ‘This latest investment in our data centres will put our storage capabilities at the forefront of the industry, and grant our customers greater flexibility as to how they store and access their data, helping them to achieve low levels of latency for real-time applications. Claranet manages petabytes of customer data in its data centres, with a lot of this managed on shared storage platforms. These shared platforms give customers the ability to pay-as-you-go and buy storage as they need it, on an OpEx basis, as a fully managed service.’

‘Business applications have differing security, availability and performance requirements, and we have seen an increasing demand for high performance storage solutions to underpin modern IT applications. While we’ve offered high performance SSD solutions for many years, we see them becoming the norm, rather than the exception for large parts of the IT estate. The ability to guarantee levels of performance, while offering cost effective solutions for data with lower performance requirements, will become critical. Investment such as this ensures that we maintain our position as one of the leading MSPs in Europe and continue to offer our customers premium levels of service’.

www.claranet.co.uk

PURE VM SUPPORT

Pure Storage has announced the availability of a new Replication Adapter (SRA) for VMware vCenter Site Recovery Manager (SRM) and an enhanced VMware vSphere Web Client Plug-in. Used in conjunction with Pure Storage FlashArray 400 Series arrays, the solutions deliver a simple and seamless storage and virtualisation management experience, comprehensive disaster recovery protection, and scalable availability for VMware environments.

Offering tighter, richer integration with FlashArray’s Purity Operating Environment, the expanded Plug-in enables VMware administrators to perform storage provisioning within the vSphere management interface and deliver agile storage services that are optimised for better virtual machine availability and performance.

www.purestorage.com

DOT HILL EXPANDS ULTRA SERIES

Shipping now, the Dot Hill Ultra56 AssuredSAN is a hybrid storage array based on an ultra-density chassis that supports both NEBS Level 3 carrier and MIL-STD government requirements and up to 1.34 petabytes (PB) of raw capacity in only 7 inches or 4U of rack space. The high-density AssuredSAN array includes high performance 4004 controllers, affording up to 6400MB/s of sustained read performance.

The Ultra56 is available with Dot Hill’s RealStor version 2.0 application workload-aware intelligence software, which maximises performance and simplifies management of hybrid storage arrays.

“The Ultra Series of storage solutions is the latest example of how Dot Hill evolves storage through continued innovation. Specifically, the ultra-density chassis of the Ultra56 offers twice the performance and capacity per rack unit compared to traditional chassis, for unprecedented throughput and transactional performance. This technology has been developed with mission-critical applications and data centre efficiency in mind, and has enabled us at Hammer to deliver Dot Hill’s storage offerings into new exciting markets,” stated Jason Beeson, sales director, Hammer, a European specialist storage distributor.

www.dothill.com
d:ternity is a new, highly secure and hassle free service for archiving large volumes of data and video content. A state-of-the-art, non-proprietary and fully scalable platform that reduces your operating costs, whilst maintaining critical security and compliance requirements.

Future-proof your archive. Today.

Visit us on Stand D105 at Data Centre World 2015 for a demonstration or www.dternity.com for more information.
Over the past several years, OCZ has delivered a leading SATA-based SSD portfolio that supports both client and enterprise applications, and regarded by research firms as one of the leading SSD providers in this market space. OCZ-branded client drives cover the complete gamut of entry-level value, mainstream, enthusiast and power user solutions, and the performance they deliver are typically at the top of their respective classes.

Client SSDs are intended for personal computing applications and though they offer lower acquisition costs than enterprise SSDs, they are not designed for the data centre. They are designed to support one client/single application I/O access where response time is critical especially for such applications as system boot-ups, file transfers and back-ups. The endurance and reliability typically built into client SSDs are not at an enterprise-class level.

As most client SSDs do not provide any protection against the consequences of an abrupt power failure, deploying them in the enterprise can put data at risk and incur data centre costs dealing with problems and/or replacements. In understanding these dynamics, OCZ has developed and evolved its SATA-based enterprise SSD portfolio over the years to not only address varied workload requirements - and deliver leading sustained performance with predictable, efficient and consistent latency responses - but also provide power failure management to customers.

**INTRODUCING SABER 1000**

The Saber 1000 SSD Series is specifically designed for read-intensive applications such as media streaming, video on demand (VOD), virtual desktop infrastructure (VDI), online archiving and web browsing. It is also targeted for high-volume deployment hyperscale, web-hosting and distributed computing environments whereby the volume of data (and the demand for certain types of data) can increase exponentially but must still be accessed quickly. In these cases, hyperscale data centres utilise virtual servers and accommodate increased processing demands typically through cloud computing without requiring existing physical space, cooling or power, making the Saber an ideal, cost-effective solution for those environments. Examples of large distributed computing environments include Facebook, Google, and Amazon.

As not all SSDs and data centres are created equal, the key to achieving increased data and system performance is to understand how the SSD performs under specific application workload requirements - whether the workloads are read-intensive, write-intensive or mixed between the two. Based on research provided by TrendFocus in October 2014, SATA-based enterprise SSDs are currently used for read-intensive applications, equating to 70% usage, while mixed workloads represent 25% usage and write-intensive workloads represent 5% usage (see Figure 1). As the volumes for read-intensive applications continue to grow, OCZ mirrors this industry trend with read-intensive solutions targeted for hyperscale workloads, as well as advanced solutions targeted for mainstream enterprise mixed workload applications.

Whether the workload is read-intensive, write-intensive, or mixed, efficient predictable performance is essential to the success of the enterprise so that connected users are provided with a faster, more responsive storage experience. Without this level of consistency, I/O response latency spikes become evident in the system requiring IT personnel to adjust application workload requirements accordingly, which in turn increase maintenance and support costs, as well as overall total cost of ownership (TCO).

**SPEED CHECKS**

The Saber 1000 SATA III SSD Series utilises cutting-edge A19 nanometer NAND flash
process geometry from Toshiba coupled with OCZ’s internally-designed Barefoot 3 controller that enables full design control over the product roadmap while delivering high performance storage, and required endurance and drive reliability for enterprise hyperscale applications.

Designed to support 240GB, 480GB and 960GB usable capacities, the Saber 1000 Series delivers consistent sustained I/O performance across all capacities to accelerate enterprise applications. The performance metrics for a 960GB capacity Saber 1000 SSD include read bandwidth of up to 550 MB/s, write bandwidth of up to 470 MB/s, 4KB random read speed of up to 98,000 input/output operations per second (IOPS), and 4KB random write speed up to 20,000 IOPS.

The Saber 1000 Series is delivering great performance for today’s typical data centre applications, and employs unique firmware features that enable heavy read queues to be prioritised in short bursts that literally allow the SSD to ‘shovel’ data at incredible speeds to clear the queue and return to normal housekeeping functions.

MADE TO LAST
The Saber 1000 SSD Series is engineered to provide endurance and data reliability tools through its powerful Barefoot 3 controller and associated firmware. This includes flash management tools that can analyse and dynamically adapt to increasing NAND vulnerabilities as flash cells wear.

In the event of a sudden power loss, the Saber 1000 Series uses a technique referred to as Power Failure Management Plus (PFM+) which holds up the SSD circuitry long enough to ensure the integrity of the device so that it can be fully operational again once power is restored. To achieve this, each Saber 1000 SSD uses an internal 16 Byte PFM+ log that describes a single action performed on the NAND and this log contains only the essential data needed to rescue the SSD from metadata corruption. As a result, the PFM+ logs are accumulated and saved frequently with no impact on overall SSD performance. As most enterprise and hyperscale data centre servers are deployed in clusters, PFM+ ensures that once the power is restored, and the server cluster stabilises again, all Saber 1000 SSDs will return back to the condition they were in at the time of failure.

In the enterprise, it is imperative for in-flight write operations to complete during a power failure or data can be lost, corrupted or cause system errors. For read-intensive applications, such as hyperscale workloads, completing in-flight operations during a power loss is not as critical.

With support for Power Failure Management Plus the Saber 1000 Series enables each connected SSD to remain operational post-outage, preventing it from becoming a brick (which in simplest terms means it cannot be communicated with and data cannot be recovered). The advanced flash management capabilities can not only manage flash resources but perform operations that free up SSD resources such as:

- Wear-levelling that organises data so the program cycles are evenly distributed amongst all flash cells, preventing the flash from being overused, which in turn, slows cell wear, and
- Garbage collection that determines which flash cells have unneeded data and either consolidates or erases those blocks to reclaim usable capacities, which in turn, reduce cell use that equates to improved drive life.

RIGHT TOOLS FOR THE JOB
The Saber 1000 is supported by the industry-standard, self-monitoring analytical and reporting technology (SMART), implemented at the system level and based on past and present use-analysis it receives from the SSD controller. SMART initiates warning messages to the controller about potential drive failures enabling IT administrators to respond in a proactive manner.

This monitoring and management capability rises to new levels when used in combination with OCZ’s StoragePeak 1000 SSD Management System. This network-accessible management system securely connects to multiple hosts (running Linux or Windows) providing a cross-platform view of the OCZ SSDs connected to servers, storage arrays or appliances, and includes a user configurable alerting system that enables IT corrective actions to be initiated at an early stage.

StoragePeak 1000 simplifies network administration by allowing IT managers to connect the application to multiple hosts across the network via engine software that the user installs on each host. It continually monitors the environment and will discover new hosts when they are added. When a new host is discovered, a complete inventory of the individual OCZ SSDs associated with that host are provided while enabling quick access to the SSDs themselves.

For IT departments adding SSDs to the enterprise, the ability to centrally manage and maintain them are crucial for this level of host and SSD management. OCZ’s StoragePeak 1000 enables IT managers to perform mission-critical actions, extend drive and NAND flash life, and maximise data centre ROI from their deployed OCZ flash-based storage resources.

OCZ developed its SATA-based SSD portfolio - including the new Saber 1000 - specifically to address specific workload requirement and deliver leading sustained performance, along with predictable, efficient and consistent latency responses; all while providing the endurance and reliability tools expected by today’s IT managers.

More info: www.ocz.com/enterprise

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PRODUCT REVIEW

WD SENTINEL DX4200 WINDOWS STORAGE SERVER

Not all organisations require an application server, but most have enterprise class storage requirements for business data, requiring a clear, dependable approach. The need to easily back up, restore and secure data is omnipresent, but application servers may in some cases be overkill.

Launched October 2014, the WD Sentinel DX4200 is a storage server. It is designed to join, not host a domain. In this way it can augment primary domain storage capacity, or stand alone.

Without the overhead of serving applications fewer resources are required, and this storage powerhouse meets the challenge in style. The DX4200 is a small, powerful, network attached storage device: the one under review has a single 2.5 inch disk dedicated to running the OS (Windows Storage Server 2012 R2 Workgroup), and four 3.5 inch, 4TB WD Se enterprise drives for storing data. Its foundation is an Intel Atom dual core processor, 4GB of ECC RAM, expandable to 16GB, four USB 3.0 ports, two 1GB Ethernet ports, and the capability for external redundant power. A second OS drive can be added without reducing data storage to create a mirrored RAID for increased OS protection.

The role of this device is specific and its installation and management is similarly focused using a proprietary user interface, the WD StorCentral Dashboard. It was easy to navigate, provides a useful range of wizards to simplify and speed up common tasks without fuss or specialist knowledge, and offered some very useful visibility of server performance.

In its simplest deployment, the device might be the primary storage service for a sole-trader or small business: equally, it can seamlessly integrate into an existing Active Directory estate with MS Server Manager used to provide a single view of all storage devices, including our DX4200. Using MS Storage Spaces, a storage pool can be configured based on grouping discovered storage resources.

The user interface provides many configuration options around shares, folders, permissions, quotas, and reporting, alerting, and server performance. WD has a penchant for combing best in class and with contributions from Microsoft and Intel, users can deploy a range of third-party utility applications to fulfill requirements, including anti-virus and disaster recovery.

Both the MS operating system and WD functionality can be configured to auto-update using the interface. Data management is rightfully centre stage, making it easy to back up endpoint data, for example from PCs, and also to back up the storage server locally, remotely, or indeed to the cloud.

Physically it is very neat with a small footprint and Windows familiarity. The four data drive bays are secured behind a lockable door and the server itself has a Kensington security slot so that it can be physically tethered. Hard drives can be hot swapped and it’s a pleasing experience, as WD has taken the innovative stance of making it a tool-less and tray-less operation, making it a fast, live, plug-and-play procedure to add or replace a drive.

Many other NAS devices are LINUX based. This for some will not be a problem, but WD is offering a safe, friendly, and in some respects familiar experience to those more at home with the MS environment. As a domain member this device can, in addition to its standalone functionality, act as a means to expand the capacity of the WD DS6100 Application Server (also reviewed in this issue of Storage), and presents its resources neatly and logically in the resulting storage ecosystem.

Product: WD Sentinel DX4200 Windows Storage Server
Supplier: WD
Tel: 01372 366 000
Web site: www.wdc.com
Price: From £999 excluding VAT

VERDICT: Whether deploying the DX4200 for standalone storage or additional domain storage, users will find that WD has done a great job of doing what it consistently does so well, while adding substantial flexibility, range and functionality in its ‘best of breed’ approach.
When data grows & demand increases, but budgets don’t.

Meet the all-new

**Saber 1000**

SATA 3.0 Enterprise SSD series.

**Features**

- OCZ’s Barefoot 3 controller, in-house firmware, and next generation A19nm NAND from Toshiba
- Delivers sustained performance and consistent I/O responses for high-volume deployment enterprise SATA SSDs
- Supports Power Failure Management Plus (PFM+) to protect against unexpected power loss events
- Central management capability via OCZ StoragePeak 1000 software suite
- Available up to 960GB

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- Cloud Infrastructure
- Customer Relationship Management (CRM)
- Online Archiving
- Video Editing/Photo Sharing
- Enterprise Content Management (ECM)
- Virtual Tape Library (VTL)

**OCZ**

A Toshiba Group Company

[OCZ.com](http://ocz.com)
David Tyler: It's clear from even a cursory glance at the current Quantum product offerings that the traditional view of the company as being primarily a tape solutions vendor is massively wide of the mark. So how should we be describing Quantum in 2015?

Christo Conidaris: Quantum has changed as the market has changed, and the market has changed as data itself has changed. Storage and backup used to be about databases and similar datasets - structured data - but today every business also has to deal with virtualisation, with unstructured content such as video, as well as exponentially increased volumes of data from systems using mapping/GPS, telemetry, encrypted files, and so much more.

During all of these market changes, Quantum has been able to remain 'ahead of the norm' in terms of technical expertise. This has allowed us to position ourselves as being able to offer true next generation backup solutions. We're the only vendor that sells both tape and disk-based which gives us 'device-independence'. This translates into peace of mind for our customers as they don't have to worry that they're being sold anything other than the best fit solution for their requirements.

Now we're seeing disk-based backup become a significant part of Quantum's business, with growth up by 11% in Q2 FY15, compared to the previous year of the same period.

DT: What are some of the issues that are driving changes in how organisations plan their storage and backup?

CC: Traditional infrastructures are breaking down as a result of greater volumes of data, the variety of data types, and the need to store data forever and continue to get value out of it. Throwing more spinning disk at the problem simply won't cut it anymore, nor will legacy backup approaches. At the same time, big news stories such as the LIBOR fixing scandal are driving compliance initiatives, and as a result the finance function is much more heavily involved in the procurement process. The whole landscape is changing forever.

We see the world evolving to a new infrastructure based on tiered storage solutions with 'smart data movement' that fits a customer's unique workflows. These tiered storage solutions will need to support unpredictable, on-demand access and incorporate new approaches to backup and archiving. They must leverage technologies like cloud-based object storage, policies, and cost-effective storage like LTO and LTFS. And they will need to integrate well with Flash storage, as customers begin to rely more on fast cache for immediate work, rather than traditional RAID.

DT: But despite these new areas of focus, from your mention of LTO and LTFS, there is still clearly a place for tape?

CC: Without question: and we will continue to innovate in the tape environment. Our LTFS appliances effectively combine tape with disk, allowing partitioning - and therefore virtualisation - on tape. We've also introduced EDLM - Extended Data Life Management - an optional feature of the Scalar i6000 that provides policy based data integrity checking. In Quantum StorNext environments, EDLM offers a policy to trigger tape scans based on StorNext's tape suspect count - enabling truly proactive, automated scanning of tapes. In addition, when suspect tapes are discovered through the EDLM scan, the Scalar i6000 works with StorNext so that StorNext can move those files to a new tape.

DT: As for your disk offerings, how do they address the issues you've already mentioned, such as virtualisation and the cloud?

CC: We recognise that deduplication is a variable, therefore we have to offer a capacity...
"We see the world evolving to a new infrastructure based on tiered storage solutions with 'smart data movement' that fits a customer's unique workflows. These tiered storage solutions will need to support unpredictable, on-demand access and incorporate new approaches to backup and archiving. They must leverage technologies like cloud-based object storage, policies, and cost-effective storage like LTO and LTFS. And they will need to integrate well with Flash storage, as customers begin to rely more on fast cache for immediate work, rather than traditional RAID."

on demand model' when it comes to disk-based backup. At Quantum we always over-ship disk, and users can simply 'switch on' additional space via a license key as and when it is required. For virtualised environments we offer vmPRO, which is our own software for VM backup - the beauty of this approach is that users can actually boot up from the backup itself if needed. With some 84% of enterprises now leveraging virtualisation for storage/backup, this kind of innovation is crucial.

We also now offer Q-Cloud Services, which can remove the need to buy two backup appliances - users can do replication direct into the cloud. We're very proud of just how granular our replication software is compared to anything else out there: users can replicate continuously as opposed to hourly or whatever. For organisations that perhaps can't cost justify a DR site of their own, they can now simply send the data off into the cloud. Q-Cloud sees us competing with the likes of Iron Mountain - and winning business.

DT: Clearly Quantum has been busy developing a whole raft of different approaches to different storage/backup issues, in order to change how you're seen in the market. How does the company now go about changing that perception?

CC: We're positioning Quantum as a complete archive, data protection and scale-out storage solutions supplier. We have products available now which are addressing the genuine business and technology concerns of all types of companies. We're addressing the growth in unstructured data, addressing object storage via our Lattus offerings, and addressing the need for intelligent 'data movement' tools via products like StorNext.

This is a genuine 'next generation' storage story which we're describing as the Quantum Information Workflow. What we're talking about is an end-to-end platform for keeping data accessible whenever and wherever it's needed. It starts with high performance ingest of data, whether it's streaming from a backup or archive application or whether it's generated from satellites or hi-res 4K cameras. The unique technology within StorNext enables the highest-performance ingest for scale-out storage use cases. StorNext is also integrated at the core of our DXi dedupe platforms to provide industry-leading performance and efficiency for streaming backup workflows.

At the next stage, it's all about real-time sharing and processing of data. Here again, StorNext allows data to be shared in real-time and processed in a collaborative workflow. A second example would be our Lattus object storage solutions that enable data to be kept available in near-line storage and shared amongst workgroups or geographical locations (even private cloud).

Finally, our approach is to deliver built-in intelligence that allows data to be protected and preserved within the storage platform in its native form. For many workflows, especially for unstructured data, it's just not practical to utilise legacy backup processes to protect the data. Nor does it allow data to be kept available to users in native form. For example, with Scalar LTFS technology, you can keep data available in native format on extremely low-cost NAS that utilises LTO technology. With Lattus, we exploit geo-spread technology to provide built-in data protection, including in a hybrid cloud environment. And with StorNext, we provide intelligent policies for built-in archiving and data protection to keep data available in near-line form and well-protected.

Our Information Workflow concept is all about providing an end-to-end approach that allows data to be transformed into content or intelligence, that enables business growth or helps organisations meet their mission.

More info: www.quantum.com
A recent study from IDC predicted that worldwide spend in the enterprise all-flash storage market will grow to £1.0B in 2016 from £0.2B in 2012. That translates to a CAGR of 58.5 percent between 2012 and 2016. Flash has taken the storage market by storm, and going by the staggering numbers here, its adoption has been widespread. Having said that, is everything about flash arrays good, or is there a flip side to the story?

THE GOOD
Flash is critical to applications that need higher input/output operations per second (IOPS). Flash arrays deliver close to 1M 4K IOPS with an average latency of 1ms. These numbers prove that flash indeed brings with it high performance and ease of management. It eliminates the need for complex processes like short stroking and storage tiering as data always resides in the flash array.

Because there are no mechanical parts, flash arrays end up consuming less space and power than traditional disk-based arrays. With flash vendors incorporating compression and inline deduplication in their arrays, all flash arrays continue to add incremental value to the storage.

THE BAD
Cost is the main concern when it comes to all-flash adoption. The cost of maintaining the data in all flash has come down from £7.25 per GB, but it’s still relatively high at £2.4 per GB; so the storage admin has to carefully assess whether flash is really needed. Another major concern with flash is its durability. Flash memory can endure only a finite number of writes. Flash cells get worn out as you erase and re-write (i.e., program/erase cycles) to them, resulting in device failure at some point in time.

Also, numerous reads or programming of data in one cell can inadvertently corrupt the data in a nearby cell. When used in a hectic storage environment, the flash drive will eventually fail like any other disk drive. In addition to this, sudden data loss due to unexpected power failures also makes a case against flash.

However, many of the top flash vendors offer enterprise, all-flash arrays that provide five years of usability and 99.999 percent availability, so data loss should no longer be a roadblock to adopting flash.

THE UGLY
It is the burden of the storage admin to choose between three different forms of flash deployment - PCIe card, all flash, and hybrid arrays. The admin will have to understand the requirements carefully to deploy the right amount of flash. PCIe cards sit in the host server’s PCIe slot to act as a flash cache to accelerate the traditional storage arrays. This deployment boosts performance without adding any capacity to the storage. All flash arrays provide high IOPS, higher capacity for the space employed, improved performance, lower power bills, and ultra-low latency when compared to disk storage. However, the initial cost of deployment of all-flash arrays is very high and a complete switch to flash may be overkill.

Hybrid arrays hit the sweet spot when it comes to balancing performance and capacity needs of storage while delivering better bang for your buck. This is the best option for organisations that do not have the adequate finances for all-flash arrays. However, in a typical hybrid array, applications may compete for the flash tier of storage array. That competition, based on data accessed, could result in oversubscribed flash and sub-optimal performance for all applications.

ARE YOU EXPERIENCED?
If mission-critical apps do not find a place in the flash tier, it would sound the death knell for the storage admin. Ultimately, storage admins make the call when it comes to choosing the right, scalable flash option; and management will hold them accountable. Based on the choice of flash deployment, the admin has to be prepared to tackle its side effects as well.

Flash arrays are a godsend for those IOPS-hungry applications. However, they come with their own set of challenges for the storage admin. With the different deployment options available, an administrator should run beta units at the data centre to evaluate the performance against the requirement to make an informed decision. After all, experience is something you shouldn’t get just after you need it. And experience with flash is something that will benefit most companies today and in the future.

More info: www.manageengine.com
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David Tyler: For many people the Toshiba brand may still be closely associated with laptops and mobile computing generally, rather than enterprise storage - but in fact your business focus has shifted dramatically in recent years. How would you summarise where Toshiba sits in 2015?

Nick Spittle: Enterprise is the real growth area in the marketplace right now, and it’s also very much an area Toshiba are addressing, whilst servicing the mobile space - where we have been present for a number of years. From early 2009 Toshiba had identified that the market was evolving. At that time the worldwide storage market was around 550 million units per annum: 2.5” client devices made up around 300 million units of those drives, and the 3.5” market around 200 million units, with enterprise products making up the difference.

Fast-forward to 2013, and mission-critical - i.e. the product expertise acquired through the acquisition of Fujitsu Enterprise HDD - is plateauing. This year, we will probably see the official end-of-life for large form factor (LFF) products in that sector. It will then be focused on the small form factor and this is where our product portfolio matches up quite nicely. The EOL of large form factor products has been predicted for the last 6 years - things didn’t move quite that quickly, especially in the European market, where we have a lot of legacy business.

DT: How does technology like SSD fit into your mission critical and other target market sectors?

NS: ‘Mission-critical’ - traditionally our 10K and 15K rpm products - is now complemented by our enterprise SSD products. Back in 2011 Toshiba, as the inventor of NAND flash memory, began to utilise that NAND expertise to develop Enterprise and Client SSDs. We have seen some of the highest growth coming in enterprise SSD markets in excess of 60% year on year growth - but it should be said that this is because the market is starting from a very low point.

Our own conservative estimates predicts the eSSD market to exceed 15M units worldwide by 2017. In volume terms this may not seem high compared to the numbers mentioned above but in revenue terms the AUP of eSSD is significantly higher than enterprise HDD and therefore provides an attractive market. Of course the AUP will reduce as the volume increase and NAND technologies develop. This is why it is attractive to many vendors at the moment. There are a lot of vendors out there right now, compared to essentially just three HDD vendors.

It’s also worth mentioning the consumer SSD market, which we will see growing from around 80 million units today to perhaps 130 million units over the same timeframe by 2017. Enterprise SSD is primarily SATA-based now, but we would expect that to split by 2017 into three main interface options: SAS, SATA, and PCIe. Our acquisition of OCZ last year will allow Toshiba to leverage their expertise in PCIe interface and engineering expertise in both enterprise and consumer space.

DT: How important have mergers and acquisitions been for Toshiba in building a complete storage portfolio for business users?

NS: We now have a wide range of offerings: client (mobile 2.5” and desktop 3.5”), enterprise HDDs (2.5” small form factor and 3.5”), and both client and enterprise SSDs. The next area is business-critical. Toshiba combined the expertise from the enterprise business and the vast experience from the Toshiba client team, to develop our near-line products. Here again we are seeing good growth in the worldwide market at around 13% per annum.
"It has taken time for Toshiba to bring the above together, but now we have a strong focus and strategic outlook that is recognised and understood right across the business. As a leading provider of integrated storage solutions Toshiba sets many of today’s industry standards for storage technology. Toshiba’s drives are at the heart of nearly every storage application and can be found inside the world’s leading GPS navigation systems, consumer electronics, computers and enterprise solutions."

Business-critical is now vastly outgrowing mission-critical in the market. With future growth in cloud and data centre we are seeing opportunity for large storage devices exceeding the current 6TB capacity to 8TB and even 10TB per HDD device.

There is a whole new category emerging of cold storage: products that are not required to spin constantly or low spin, low power devices for data that doesn’t need to be online or readily available to the end user. These drives will incorporate additional technologies to help address those specific capacities; Toshiba are looking into a number of technologies to achieve that higher aerial density.

DT: With so many different technologies and messages to manage, is there a danger of sending confusing messages to the market?

NS: It has taken time for Toshiba to bring the above together, but now we have a strong focus and strategic outlook that is recognised and understood right across the business. As a leading provider of integrated storage solutions Toshiba sets many of today’s industry standards for storage technology. Toshiba’s drives are at the heart of nearly every storage application and can be found inside the world’s leading GPS navigation systems, consumer electronics, computers and enterprise solutions. In addition, Toshiba offers an extensive range of advanced technology drives such as high durability 24/7, extended temperature and SSDs for the consumer, Industrial, Enterprise, Surveillance and Automotive sector.

Toshiba uniquely has ‘a foot in both camps’ when it comes to storage technologies: we have 40 years of experience in manufacturing HDDs, and SSD leveraging of our own NAND business.

DT: The growth of cloud computing has clearly altered the storage landscape for end users and businesses alike - what difference does that make to how a company like Toshiba sells its solutions?

NS: We’re all putting our data somewhere: increasingly in the consumer space users aren’t actually sure exactly where that is! But many end users still have concerns with cloud storage regarding security. Businesses though will continue to drive cloud adoption: cloud storage providers and data centres containing masses of solid state and rotating Enterprise products. At Toshiba we have products to address every tier of that storage ‘pyramid’.

More info: www.toshiba-storage.com
**PRODUCT REVIEW**

**WD SENTINEL DS6100 WINDOWS SERVER**

For smaller businesses some IT resources are out of reach, even though they can be justified through business need. This imposes operational restrictions on such businesses – and servers fall firmly in this category. The benefits of server deployment include centralisation of data, employee collaboration and remote access to data and applications. However WD has effectively dismantled this barrier to server adoption with its WD Sentinel DS6100 offering.

Apart from scale, the application and storage requirements of organisations large and small are similar, but for smaller organisations, cost and technical complexity can put servers out of reach. The DS6100 from WD meets this challenge head on, offering organisations an effective, affordable, and easy to implement route to their first server. Pre-built with Windows Server 2012 R2 Essentials, it is small, powerful and impressive. With the DS6100, WD has radically minimised server set-up and redefined out-of-the-box: ours was configured and working in around 30 minutes.

The DS6100 boasts impressive standard features, including two OS boot drives for resilience and four 3.5-inch drive bays with 16TB capacity, using four WD 4TB Se enterprise drives. There is an Intel quad core Xeon processor, 16GB of ECC RAM, expandable to 32 GB, dual redundant external power supplies, dual Gigabit Ethernet ports, and six USB ports offering USB 3.0 and USB 2.0.

The dual boot drives are pre-configured in RAID 1: the data drives can be configured as JBOD or RAID (0, 1, 5, and 10). With Windows Server 2012 R2 Essentials OS pre-loaded it provides Active Directory administration, Remote Web Access, VPN Compatibility and iSCSI. We configured the DS6100, which must be the Primary Domain Controller, using a hardware RAID storage configuration, but the in-built MS Storage Spaces offers software RAID if preferred.

This highly capable storage server can run an organisation’s line-of-business software applications and will be very at home in an organisation of up to 25 seats. Designed to be an organisation’s first server deployment, it provides support for 25 users and bare metal Windows client backup for 50 devices. Future proofing is covered as well because the OS can be transitioned to Windows Server 2012 R2 Standard by purchasing the necessary licenses. The Windows Server software offers an impressive list of supported line-of-business applications and services, including Office 365 integration and SAGE Accounting. This is no compromise.

From the set-up screen, we determined the update process for both WD and MS software and created user accounts, server folders and shares. We were also able to configure external access, using HTTPS and client connections. We used a laptop for our Client which installed a small connection agent showing four options (permission dependant), and of course Windows Explorer offers the familiar folders and share view. Group Policy can be implemented from the server to set up user and distribution groups.

Using the Essentials interface, a few tabs navigate you to a lot of well organised options: mostly, these can tolerate post installation attention as they represent management and fine tuning options. As you would expect, you can set up quotas and implement them elegantly with firm limits or some practical flexibility. Equally, from the health monitoring tab you can view warnings and set up alerts. Fan speeds, various temperature measurements and health reports are also available.

In summary then; a lot of small businesses are serious players in their chosen market, but are often impeded by the complexity of Enterprise scale solutions, and especially servers. The DS6100 brings impressive server and storage capability without the fuss and complexity that many businesses just cannot accommodate.

**Product:** WD Sentinel DS6100 Windows Server  
**Supplier:** WD  
**Tel:** 01372 366 000  
**Web site:** www.wdc.com  
**Price:** From £2,129 excluding VAT

**VERDICT:** WD excels at using proven technology to create something special. The DS6100 is perfectly formed, competitively priced and a real pleasure to work with.
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VIVA LAS VEGAS

WHILE MOST OF THE MAINSTREAM MEDIA FRENZY REMAINS AROUND 4K TV SETS AND MICROSOFT HEADSETS, STORAGE EDITOR DAVE TYLER MANAGES TO FIND PLENTY OF STORAGE-RELATED NEWS FROM THIS YEAR’S CES FAIR IN LAS VEGAS

Once again the CES circus descended upon its spiritual home, Las Vegas, at the start of the year, and once again the PR and media hype machines went straight into hyperbole mode around - for the most part, at least - largely unremarkable advances in tech: tablet, mobiles, TVs: same old, same old, right? But behind the mega-launches and celebrity endorsements (more headphones 'designed' by music artistes with little or no knowledge of electronics or audio tech, anyone?), there was plenty to interest the readers of Storage magazine.

VENDOR NEUTRAL

Of course, as ever, there were product announcements aplenty from storage vendors. Our friends at OCZ used the event to showcase their 'highly anticipated' JetExpress SSD controller. Designed and developed in-house, JetExpress will be the heart and soul of OCZ's future product line. JetExpress silicon is native SATA and PCIe/NVMe and will support multiple form factors including M.2, 2.5-inch SATA, and SFF-8639 which enables PCI Express speeds in a compact 2.5-inch form factor. According to OCZ, "the flexible and advanced architecture of JetExpress is designed to offer superior flash endurance empowering SSDs to continue down the path to ubiquity in both mainstream notebooks and hyperscale data centres".

OCZ also unveiled their Vector 180 series. This new enthusiast-grade SSD takes reliability to the next level with its onboard Power Failure Management Plus (PFM+) feature while providing the industry-leading performance the Vector series is known for. The Vector 180 line will be offered in 120GB, 240GB, 480GB, and a new
960GB model demanded by today's power users who want more of their data and media available to them at solid-state storage speeds.

Meanwhile Seagate revealed a new brand identity and logo, as well as a selection of product offerings including two new storage products for home users, Seagate Personal Cloud and Seagate Personal Cloud 2-Bay. Seagate Personal Cloud provides the accessibility of cloud storage with the peace of mind that content is stored safely at home. What differentiates these two Personal Cloud drives apart is how easily they can stream content to smartphones, set-top boxes, tablets, PCs or televisions via the Seagate Media application.

Additionally, when used in conjunction with the acclaimed Seagate Mobile Backup app and Dashboard software, Seagate Personal Cloud also serves as a central backup device for PCs, Mac computers, USB drives, iOS and Android mobile devices.

Seagate also unveiled the new Seagate Seven drive as "the slimmest way to carry 500GB of data", with its name representing the 7mm depth of the 500GB drive. The simplicity of the industrial design of the Seagate Seven pays tribute to the roots of computer storage while simultaneously celebrating the latest advancements in storage innovation. At the same time their LaCie range also saw extensions: LaCie Rugged RAID features twice the speed and capacity of a standard mobile hard drive - all with the same Rugged portability and durability that enthusiasts have come to expect. It is also the only product in its class to feature hardware RAID 0 and 1, which lets professionals optimise the product for speed or data security according to their workflow - and use it on any Mac or PC.

OUTDOORS TYPES

Alongside this was the newly launched LaCie Mirror portable hard drive, wholly encased in scratch resistant Corning Gorilla Glass. This unique device is at once both a functional 1TB hard drive and a striking piece of decor. The LaCie Mirror hard drive will adorn any desktop as it sits in its base made of a single piece of ebony wood from Makassar. It was designed in collaboration with the acclaimed French designer, Pauline Deltour.

More ‘rugged outdoorsy' offerings were on show from G-Technology: The G-DRIVE ev Raw is a rugged and lightweight portable hard drive that’s small enough to fit in a backpack, briefcase or purse, and strong enough to withstand a 1.5-meter drop, protecting up to 1TB of data. This durable, lightweight drive - 35 percent lighter than the original G-DRIVE ev - is USB 3.0 bus-powered and designed to go anywhere, providing on-the-go access to photos, videos, music and more. The G-DRIVE ev Raw comes with a USB 3.0 cable, and can be used as a standalone device, or used with the Evolutions Series’ G-DOCK ev with Thunderbolt or the new ev all-terrain case for ultra-fast transfers and editing.

Toshiba too had a raft of product announcements around storage. First was the Canvio Connect II portable hard drive. Available in capacities of 500GB, 1TB, 2TB and 3TB the drive support remote access through PogoPlug software and comes with 10GB of cloud storage. The drive also

"Leading manufacturers and users of all storage types - magnetic and optical disk, tape, flash, and other special storage technologies - come together every year to share new products and new approaches to using that technology. It's always an eye-opening experience."
supports automatic, scheduled backups and cloud backup through bundled software.

Next up from Toshiba was the simple but impressively specified 3TB Canvio Basics, the first portable drive to offer so much storage. More unusual is TransferJet, an adapter that provides wireless data transfer at rates of up to 560 megabytes per second between PCs and mobile devices. Toshiba claims this is ten times quicker than WiFi and a hundred times quicker than Bluetooth. And last, but not least, is the FlashAir III wireless SD card. Available in capacities of 16GB and 32GB, the card is able to communicate with your Wi-Fi network and thus any computers on it, which makes transferring files from the card much more convenient.

BUSINESS AS UNUSUAL
What really stood out for us at this year’s CES though, was outside of the usual exhibition areas and product booths, where we found a focus on storage at the separate Storage Visions event, which gave us two days of seminars, round tables and keynotes covering consumer electronics, media and entertainment, enterprise storage suppliers and customers, storage device manufacturers, storage system builders, and storage users. The event was hugely popular and well attended, and the likelihood is that this will grow into a larger part of the overall trade fair environment in future. The overall conference theme this year was ‘Storage with Intense Network Growth (SWING)’, and recognised the impact of the connection of everything on digital storage growth and development.

One attendee commented: “I get more information from the real movers and shakers at Storage Visions than I get at the whole CES. It’s like a private seminar because of the people and the size.”

Session topics included:
- Creative Storage: Looking for Storage for High Resolution Content Capture and Production
- Finding and Keeping It Safe: Protecting, Finding, Storing and Recovering
- Analyst Perspectives: What Will Cloud Storage Do to Local Storage?
- Evolve or Die!: Storage Developments Drive New Storage System Options
- What we Want: A Conversation with Digital Storage End Users
- Taking It To The Streets: Getting Content Where it Needs to Go
- Young Users Speak Out: What will Drive Future Consumer Devices
- Saving the Best to Last: Long Term Content Protection and Archiving

Sponsors and exhibitors at Storage Visions included many of the industry’s biggest names: SanDisk, Samsung, Quantum, HDS and Fujifilm, to name just a few. The presenters were similarly high quality, with several of the sponsors already named among the list, alongside the likes of IBM, Facebook, Intel and SpectraLogic.

As another delegate enthused: “Storage Visions is the focal point for all storage technologies. Leading manufacturers and users of all storage types - magnetic and optical disk, tape, flash, and other special storage technologies - come together every year to share new products and new approaches to using that technology. It’s always an eye-opening experience.”

If you’re even remotely interested in developments around the storage industry, and you’re at CES, and you’re not making a point of getting along to Storage Visions, you are missing out.
ULTIMA BUSINESS SOLUTIONS, an IT solutions provider with a 24-year track record, has grown from a traditional reseller into the solutions-focused organisation it is today. The company is structured around three core areas - fulfilment, professional services, and managed services - much of which involves the support and sales of cloud computing.

The relationship between Pulsant, the cloud computing, managed hosting and colocation expert, and Ultima began four years ago. The IT solutions provider sought a secure, caged area within Pulsant’s Maidenhead data centre facility to host its cloud infrastructure.

“Part of our managed services portfolio includes cloud services that are supported, backed up and managed by our technical support centre in Reading,” said Danny Fisher, head of managed and support services at Ultima. “Our requirements were of course security and reliability, but we also wanted the location within a reasonable distance of our support centre and we ideally wanted a partner that was able to work alongside us, as a visible extension of our offering.” In addition, Ultima required a hosting environment that was scalable so that it could offer additional colocation services with networking interconnects.

After several months of reviewing the cloud market and evaluating solutions in terms of their technology offerings, contract flexibility, delivery of SLAs and overall management mechanisms, Ultima selected Pulsant.

“We are driven by our customer base and in Pulsant we found a business that is very similar to us in approach. Pulsant is very much aligned to us and our philosophy. For example, it offered us a cloud platform based on HP software, a VMware hypervisor, a high performing network with Cisco as the backbone, and security provided by Check Point - all things that reinforced the synergy between our two organisations. The big plus was that Pulsant specialised in providing private, public and hybrid cloud solutions which is exactly what we were looking for.”

The team at Ultima worked closely with Pulsant to shape an Ultima-centric offering and very quickly started migrating a number of its customers from on-premise and other cloud platforms onto Pulsant’s Enterprise Cloud.

“We host some of our own systems in the Maidenhead facility and it is excellent, they have a great team that works closely with our technical support centre and product champions for cloud. As a solutions provider we are bound by our SLAs so it is imperative that we have people on the ground who are capable and efficient to see that through,” said Fisher.

The company also enjoys a collaborative relationship with the cloud provider as a member of the Pulsant Partner Programme. When selling cloud solutions to potential customers, Ultima works with Pulsant from a deal’s inception, pre-sales and sales assistance, and to create commercial and technological flexibility.

“We looked for a partner that offered us compelling technology-proven, contractually stable, secure platform for us to leverage. And we definitely found that in Pulsant,” concludes Fisher.

More info: www.pulsant.com
CASE STUDY: JUNGHANS GROUP

Backup No Longer Needling Wool Retailer

Specialist online retailer the Junghans Group has successfully deployed Actifio to dramatically simplify data management while enhancing data backup and disaster recovery for its mission-critical SAP environment.

In 1950 Erhard Junghans opened his store in Aachen. This was the foundation for the Junghans wool mail-order house, which was then established in 1954. Through diversification, in 1985 the mail-order specialist ‘Pro Idee’ was established. Today, the Junghans Group is active in Germany as well as several European countries.

Now the largest speciality retailer of its type in Germany, Junghans is continuing to expand throughout Europe, but its existing backup tools were not keeping up with the demands of the growing business. Junghans chose the Actifio platform to manage and protect its SAP application data because of Actifio’s operational simplicity, fast recovery and its SLA-driven protection to minimise the risk of data loss.

As the Junghans IT team supported the Group’s expansion, their main concern was securing against data loss and disasters. The company’s existing backup systems - based on LTO tape libraries and legacy backup software - had proven too costly, inflexible and unable to meet the SLAs of the business. With two busy mail-order houses to support, it was imperative for the lean IT team to find a solution to safeguard their critical SAP data, but also consolidate infrastructure wherever they could - to reduce complexity and administrative costs.

Actifio delivers copy data virtualisation to hundreds of global enterprise customers and service provider partners in more than 30 countries around the world. The company’s 'Virtual Data Pipeline' technology decouples data from infrastructure, enabling dramatic improvements in business resiliency, agility, and access to the cloud. Actifio replaces siloed data management applications with a radically simple, application-centric, SLA-driven approach that lets customers capture data from production applications, manage it more economically, and use it when and where they need to.

Junghans found that Actifio brought several notable benefits and efficiencies to the Group, including:

- Backup no longer needling wool retailer
- Specialist online retailer the Junghans Group has successfully deployed Actifio to dramatically simplify data management while enhancing data backup and disaster recovery for its mission-critical SAP environment.
"We back up our SAP systems every 15 minutes; the backup of current inventory and transaction data is extremely important for a mail-order company. In the event of a data centre failure or an individual system collapse, our Actifio system allows us to boot mission-critical IT services quickly at a different location. With Actifio, the re-establishment of our multi-terabyte SAP system takes just five minutes."

- Reduction of SAP backup times from days to 15 minutes, and restoration of SAP services in 5 minutes;
- Elimination of multiple data management tools including tape libraries and traditional backup systems; and
- Reliable SLAs to meet the Recovery Time and Recovery Point Objectives (RTO and RPO) of the business and the ability to secure data as required by data protection legislation.

Mario Staas, Head of IT Services at Junghans Group, comments: "Our team is relieved because working with Actifio is very easy. Actifio is reliable, and our employees benefit from its ability to recover data rapidly and minimise any loss in a disaster. Our company benefits from Actifio's ability to meet demanding SLAs, and in turn, that positively impacts our customers."

By virtualising the management and retention of data, Actifio allows businesses to eliminate multiple data silos and point tools for backup, disaster recovery, business continuity, analytics, and test and development, and instead rely on one, SLA-driven, data virtualisation solution. Actifio's platform provides Junghans with the ability to protect and manage a single 'gold' copy of each application's data which will be updated incrementally forever, from which virtual copies can be accessed for any use case. This has lowered hardware and software costs, reduced dependence on expensive infrastructure and let Junghans Group's operations staff stay lean.

"We looked at a number of data management solutions from different vendors and nothing met our requirements like Actifio," said Bastian Strümpel, IT Specialist and Project Manager at Junghans Group. Blue Consult, the Kempen-based IT consulting and service provider was instrumental in the Group's successful adoption of Actifio. "We were particularly pleased with the high level of expertise and dedication of everyone involved," added Strümpel. "Only a few days after start of the implementation phase, we had deployed the system."

With around 50TB of data to protect, Junghans Group needed a data management system with rapid data processing abilities, to keep up with production workloads. The IT group can now manage its SLAs for critical workloads with ease, thanks to Actifio.

"We back up our SAP systems every 15 minutes," said Strümpel. "The backup of current inventory and transaction data is extremely important for a mail-order company. In the event of a data centre failure or an individual system collapse, our Actifio system allows us to boot mission-critical IT services quickly at a different location. With Actifio, the re-establishment of our multi-terabyte SAP system takes just five minutes."

Daily monitoring is not an onerous task for Junghans Group thanks to clear status reports from Actifio. The addition of new application servers to Actifio's management and recovery of individual data sets or even complete systems now takes just a few clicks of a mouse.

More info: www.actifio.com
One of the fundamental requirements for virtualising applications is the underlying shared storage. Applications can move around to different servers as long as those servers have access to the storage with the application and its data. Typically, shared storage takes place over a Storage Area Network (SAN). However, SANs typically have issues in virtualised environments. The first is providing consistent, reliable I/O performance where it is needed. As different applications start, stop and process data, the load on the SAN varies greatly. If a database starts a large job processing data, the SAN may become overwhelmed, which will start impacting the performance of other applications that are acting in a normal state.

Applications that are performance-sensitive are particularly susceptible to this issue, including databases (Oracle, Microsoft SQL Server); applications and ERP systems based on databases (SAP, Oracle Applications, Microsoft Sharepoint, Microsoft Dynamics); VDI (VMware and Citrix); and communications systems (Microsoft Exchange, VoIP). In addition, as the number of applications in the environment grows, IT needs to be able to scale out infrastructure seamlessly and quickly. Any time maintenance is done on a SAN, the storage needs to go offline, leading to a disruption. Another issue, especially in smaller environments such as remote sites, is the reliability and complexity of SANs. When remote or regional locations (retail shops, bank branches, manufacturing plants, call centres, distribution centres, surgeries, etc.) have applications on-site, IT needs to address issues with availability and management of the infrastructure. In the simplest case, an office has two servers to ensure high availability at the compute layer.

However, the servers are connected to a SAN (typically a low-end storage array and network connections), which itself is a single point of failure. If the SAN goes offline for any reason it doesn’t matter that there are two servers; the applications have an outage, which disrupts the business. Usually there are no IT staff on-site, so simplicity of management and reducing complexity are very important. Due to the challenges of using SANs in a virtual environment, organisations are currently looking for new options. Hyper-converged infrastructure is a solution that seems well-suited to address these issues.

WHY HYPER-CONVERGED?
To provide consistent high-performance, IT can create application-specific clusters. By running the same type of application on the cluster (e.g. databases), IT is able to manage performance and identify/resolve bottlenecks more effectively. In addition, to avoid the performance limitations of a SAN, hyper-converged storage utilises Direct-Attached Storage (DAS) within servers as shared storage, moving data closer to the applications. This architecture provides better I/O performance closer to the application (therefore creating better response times), resulting in less complexity and lower cost.

RELIABLE APPLICATION PERFORMANCE
A hospital recently used DataCore Software’s Virtual SAN software to create a hyper-converged system to achieve better and more consistent application performance. The hospital had 12 physical servers running its PBX system. The organisation wanted to virtualise this application (into 12 VMs) but it was essential to provide the same level of reliable performance as the physical servers (since voice communication is vital in a
"To provide consistent high-performance, IT can create application-specific clusters. By running the same type of application on the cluster (e.g. databases), IT is able to manage performance and identify/resolve bottlenecks more effectively. In addition, to avoid the performance limitations of a SAN, hyper-converged storage utilises Direct-Attached Storage (DAS) within servers as shared storage, moving data closer to the applications. This architecture provides better I/O performance closer to the application (therefore creating better response times), resulting in less complexity and lower cost."

hospital environment). The hospital knew it wanted a dedicated cluster for the virtualised PBX application. But, its IT staff were not satisfied with available options, such as VMware Virtual SAN, which required a minimum of three physical servers (and later, they learned that actually four servers were recommended).

The consensus was that utilising three servers to run 12 VMs was wasteful and unnecessarily expensive. Instead, the hospital chose DataCore’s Virtual SAN software. This solution only required two servers for failover, which reduced costs by 33% from the onset. In addition, DataCore Virtual SAN uses adaptive RAM caching to accelerate I/O. RAM is generally 10x faster than Flash storage, so the performance of the virtualised PBX was “through the roof.” In addition, the RAM caching meant that Flash storage was optional, further reducing costs for the hospital.

The last consideration was the ability to scale with a converged architecture, compute and memory scale with storage capacity. If more storage capacity is needed, but additional compute / memory is not, then the options are less than desirable. IT can either change the drives in the servers to offer higher capacity or add another server. However DataCore Virtual SAN, with its Integrated Storage Architecture, can utilise a central SAN to complement the direct-attached storage inside the servers. This means that additional storage capacity is made available from the central SAN and data resides on the tier that best matches its performance requirement. For example, “hot” data remains close to the server tier and “cold” data remains on the SAN. This option provided the hospital with the ability to optimise application performance and add greater flexibility to scale storage and compute/memory as needed.

REGIONAL SUPPORT
For regional sites that need to run a mixture of workloads through a highly available infrastructure, the logical solution is to turn to the local storage in the servers into redundant shared storage, thereby increasing availability. In addition, reducing the amount of hardware needed for availability reduces the physical footprint of the infrastructure (which may be limited in a remote branch) as well as the costs. Lastly, by combining compute, network and storage into one infrastructure, the complexity of managing separate pieces is removed.

SDS BRINGS IT ALL TOGETHER
There is a downside to hyper-converged storage. Each deployment becomes a separate storage system to manage and maintain. To ensure that yet another, separate data island isn’t created with hyper-converged infrastructure, it needs to be integrated into the overall storage infrastructure and management. This is where DataCore’s Software-defined Storage platform comes in.

By augmenting hyper-converged infrastructure with the capacity advantages and investments made in existing SANs, DataCore can scale storage capacity and performance easily and efficiently. More importantly, the DataCore SDS platform unifies all of the storage systems from different vendors and provides one set of comprehensive storage services across the entire storage infrastructure - under a single pane of management - so it is easy to administer the storage infrastructure and unify separate data islands.

More info: www.datacore.com
CASE STUDY

CASE STUDY: TRUFFLESHUFFLE

STORAGE MAGAZINE

RETRO RETAILER WITH THE FUTURISTIC BUSINESS MODEL

RETRO CLOTHING AND GIFT SPECIALIST TRUFFLESHUFFLE ARE ABLE TO FOCUS ON THEIR CORE BUSINESS - SUPPLYING WEIRD AND WONDERFUL T-SHIRTS, HOMEWARES AND MORE - AND LEAVE THE MANAGEMENT OF THEIR E-COMMERCE FUNCTION TO HOSTING COMPANY IOMART

Retro clothing specialist TruffleShuffle is 10 years old and is just as young at heart. Founder Pat Wood started the business after coming back from a holiday in the US and getting compliments about the Dukes of Hazzard t-shirt he wore out to his local pub. He decided to start a small business selling the best retro tees he could find, named it after the famous dance in the classic 80’s movie 'The Goonies', and the rest, as they say, is history!

From a few hundred t-shirts in the early days TruffleShuffle now has hundreds of exclusive ranges of retro t-shirts, gifts and accessories. It has an online presence to rival the footfall of the biggest flagship stores on London’s Oxford Street, with millions of people visiting its website. The e-commerce model TruffleShuffle is based on is key to its success.

"Having our products easily available online is the most important thing for us," says Pat. "If we were selling our t-shirts out of a small shop we’d never make money. Our website gets around 8,000 to 10,000 visitors a day during normal months and at Christmas time that can peak to 35,000. The internet opens another door for your business - there really is no better marketplace."

TruffleShuffle is a connected business. It reaches its customers through the website, Twitter, Facebook and other social media channels. Pat explains, “We’ve embraced social media and connected it to how our customers use the internet. Even though we’re an online business, providing outstanding customer service is hugely important to us. If you treat people well they come back and that’s what we focus on in everything we do. We’ve invested in creating a website that’s appealing, easy to navigate and to buy through and crucially is optimised for mobile."

The TruffleShuffle website and database is supported by a fully managed hosting package from Iomart. There are two dedicated web servers and a dedicated master database server that are load balanced with Single Quad Core Core Xeon, lots of RAM, RAID and Redundant PSU. TruffleShuffle also has a CloudSure VM Slave Database server with RAM and HDD (SATA), Database Set Up and mirroring configuration with Postfix set up. All the servers use Linux and there is a Cisco ASA 5505 with SEC Plus Dedicated Firewall for protection.

Because of the huge amount of items they sell, TruffleShuffle’s backups need to be tailored to individual requirements. Storage demands can vary up to 50GB depending on how busy it is. Meanwhile iomart provides a 100% uptime guarantee, round the clock server and service monitoring; sys admin support; telephone and helpdesk support. There is full Operating System support and configuration services and server-side application support.

Pat Wood, Managing Director of TruffleShuffle, says, “The reason for having a fully managed service from Iomart is that during times like Christmas when we are so busy we can rely on their technical team to deal with any IT issues so we can get on with ensuring our customers have the best experience through our website and ecommerce operation. It means that orders are seamless from website to warehouse to delivery and that is vital when you're running a busy online retail business like this.”

More info: www.iomart.com
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INTERVIEW: FUJIFILM

THE FUTURE IS GUARANTEED

EARLY LAST YEAR WE HEARD FROM FUJIFILM ABOUT ITS MOVE TOWARDS A SERVICE BASED STORAGE SOLUTION OFFERING, WITH d:TERNITY. STORAGE EDITOR DAVID TYLER CATCHES UP WITH ROGER MOORE, STRATEGIC BUSINESS UNIT MANAGER AT THE COMPANY’S RECORDING MEDIA DIVISION.

David Tyler: Fujifilm is well known for its storage media, of course, but why did you make the move last year into offering a service based storage solution to your clients?

Roger Moore: Over our sixty years manufacturing magnetic media, with the last 20 years as the leader in datatape technology, we have accumulated an unrivalled wealth of knowledge about back-up and what is required for safe, secure and guaranteed archive. Corporations have been investing substantial sums in both back-up and archive processes still without them totally overcoming the issue of legacy archive, security and compliance. Put simply is their archive guaranteed - and do they have to either maintain older legacy hardware and software or rely on costly external services to recall older data?

For example: a user may be storing away their LTO tapes in a third-party storage facility - at some point they really need to check those tapes, which in itself can be a hassle, and expensive at that. Moreover they will run into problems at some point: we’ve now launched LTO6, which will read and write LTO5 tapes. However with LTO4 tapes, it is limited to read-only. So for anyone wanting to migrate to LTO6, if they have an existing population of LTO3 tapes they can’t be read. Some of our clients have tens of thousands of tapes - in the case of some financial institutions even hundreds of thousands - archived away. Their problem is that they have to retain and maintain old legacy hardware and software - and even then they will probably still have to regularly convert to new software versions. This can make it difficult for any business to predict the total cost of archival and data storage for its data centres. Our technical and product management realised that clients need a migration-free (or future-proof) service that guarantees your data or content at a predictable cost. That is exactly what d:ternity does.

DT: How would you summarise the problem you are addressing with d:ternity?

RM: The traditional in-house approach has no solution to the problem of what we call ‘cross-generation compatibility’; i.e. what happens when you move to a new generation only to find that your two- or three-generation old tapes can no longer be read - unless you retain expensive legacy drives in a library that, in all likelihood, will very rarely get used.

This is part of the problem with archives in our view: people are increasingly being persuaded to put archive onto hard disc, never mind tape, when they might never need to access that data again. It is estimated that only between 5% and 10% is ever recalled. With our approach clients can avoid the whole cross-generation compatibility issue entirely, of course.

DT: What exactly does d:ternity do?

RM: In its simplest form Fujifilm archives the client’s data in our state-of-the-art facility allowing recall when wanted, in whatever format they require. This enables not only complete confidence that all compliance and regulatory requirements are met but significant reductions in operating costs. The d:ternity service eliminates the need for an archive, library, premises costs, hardware, software and personnel.

As we established when we spoke in 2014 the actual concept is quite simple: we will back up our customers archive data for them, and store it in a format-neutral system, within our secure centre in Germany. The client can recall archived data whenever they want: via the web, on a hard drive, or a LTO tape, to suit their needs. They don’t need to be concerned about the data at all: we guarantee that data will be available, which frankly I don’t
"There is a natural inclination to simply keep storing everything away, and sending data offsite appears cheap - the problem arises later with the cost of managing and recalling that data later on. That's the beauty of the d:ternity approach. Because everything is put into a neutral file format, it can be delivered back very simply and rapidly, and loaded back into the customer's current infrastructure in a totally non-disruptive way."

believe anyone else is able to do. It really is a unique proposition.

DT: How does a service like this differ from some of the cloud offerings that have appeared in recent years?

RM: It’s important to understand that we’re really not competing here with Cloud storage: this is an archive solution. It’s not about offering to supply data back within the space of a few minutes via online access. We could do that, but it’s not what we’re about - we can offer options, including a next-day or 48-hour service for recall of data, depending on a business’ service level requirements.

Typically each client will have separate needs or priorities in respect of their backup and archive. This can range from one of simply the archive becoming too large through to tape system, disc or library issues preventing confidence in the archive data integrity. Whether data is physically transported or uploaded via the d:ternity appliance the integrity and security is guaranteed.

We will run rigorous health checks on their existing data first, because there is no point in storing data that may already have been corrupted. A second copy of all that data is stored offsite again some miles away at a highly secure (ex-military) site. The d:ternity appliance offers a bridging connection to a customer SAN or server environment. Archives can be uploaded to the d:ternity centre at times to suit the client, this removes the need for physical transportation of the archive tapes or disks.

DT: What about getting data back - how does that work?

RM: Our technical experts will spend a fair bit of time with each client, establishing the most effective way to set up their data and the archiving and retrieval process. It’s important for the client to ensure that they set up the folder structure to meet their needs. A client might specify for instance that they want to see all emails from 2009 that relate to a particular subject, and then those emails can either be brought back direct from the web portal, or if they were larger files such as video for instance, then they’d more likely be sent back physically - unless of course the client needed to have the data back more quickly. Flexibility is key.

Another area that we tend to discuss early on with potential clients is: do they really need to archive all this data at all? There is a natural inclination to simply keep storing everything away, and sending data offsite appears cheap - the problem arises later with the cost of managing and recalling that data later on. That’s the beauty of the d:ternity approach. Because everything is put into a neutral file format, it can be delivered back very simply and rapidly, and loaded back into the customer’s current infrastructure in a totally non-disruptive way.

More info: www.dternity.com
When it comes to data protection, most people don't have a clue. Many do not take the time to perform regular backups and far more have never even considered doing a backup. In a world where the amount and value of information is constantly increasing, backing up data should be as natural as brushing your teeth twice a day.

We live for about 70 years, or 613,200 hours. If you subtract time spent sleeping, we have 408,800 hours left. If you take into account our first 16 years when we're not very productive, we're left with approximately 315,000 productive hours.

So wasting five or 10 hours recreating files due to data loss can take its toll. Many can empathise with losing digital photos which haven’t been backed up. To put it into perspective, imagine what would happen if a bank suddenly lost all its data: it could go bankrupt almost instantly. The same thing would happen to insurance companies, financial institutions, and any business that consumers depend on. Even at restaurants, a large amount of information is stored electronically, such as credit card details, credit histories, and table reservations. Losing all that data would cause immense disruptions.

Large corporations understand the importance of frequent backups. Saving and archiving their data is built into their everyday routine. Medium-sized companies tend to protect the most important portions of their data, while small companies back up almost none of it. It doesn’t even cross the minds of most consumers to back up their personal data.

Despite this, there are still businesses which don’t take data protection seriously. The situation is similar to skipping regular medical check-ups or failing to visit the dentist; until a person is very sick, they don’t think about it. People are reactive: and with that comes serious risk. An examination can save or extend your life, and backing up data can save businesses and consumers from suffering the grave consequences of data loss.

WHAT IS AT RISK?

Large corporations understand the importance of frequent backups. Saving and archiving their data is built into their everyday routine. Medium-sized companies tend to protect the most important portions of their data, while small companies back up almost none of it. It doesn’t even cross the minds of most consumers to back up their personal data.

To put it into perspective, imagine what would happen if a bank suddenly lost all its data: it could go bankrupt almost instantly. The same thing would happen to insurance companies, financial institutions, and any business that consumers depend on. Even at restaurants, a large amount of information is stored electronically, such as credit card details, credit histories, and table reservations. Losing all that data would cause immense disruptions. And what if the data for an aircraft were lost? It would no longer be able to fly.

Large companies understand the risks and constantly make redundant backups and archives. Photographers, artists, musicians and designers are all professionals whose work is closely dependent on storing digital information so backing up their data is automatic. The highest quality data protection techniques don’t stop with backups, it also extends to encryption to ensure privacy. As companies or individuals produce more copies of their data, they are inevitably diminishing the level of security by creating more entry points.

Furthermore, professionals backing up off-site may store their data with third-party services and if they rely on tools with little or no encryption, they are providing direct access to anyone on those servers. Nobody wants someone else to know everything about them, but storing private information on the internet or with a service is no different. We leave ourselves and our information open to coercion by offering the service companies the opportunity to collect it all and (according to the service agreements) own it all. It is important to understand that data protection doesn’t stop at backup, but continues to encryption and managing its storage.

It is vital our generation becomes data savvy, to develop a good sense of how to work with data and preserve our privacy through independent backups. Information is arguably our most important asset. While most of the other “valuables” in our lives depreciate and quickly become outdated - gadgets, houses, cars - critical data will never be obsolete. So as you plan for the future ensure data protection plays a key role in how you work, or risk huge losses down the line.

More info: www.acronis.com

BACKUP TO THE FUTURE

SERGUEI BELOUSSOV, CEO OF ACRONIS, LOOKS TO THE FUTURE OF BACKUP SOFTWARE, WITH SPECIFIC FOCUS ON THE LESSONS SMALL BUSINESSES CAN LEARN FROM LARGE ENTERPRISES
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