

*Managing the information that drives the enterprise*

# STORAGE

## HOW FLASHY DO YOU NEED TO BE?

Hybrid arrays mix solid-state with spinning disks, but all-flash systems eschew hard drives altogether. Find out the best fits for these two technologies.

JANUARY 2014  
VOL. 12 | NO. 11

REPORTING APPS  
TAKE THE DOUBT  
OUT OF BACKUP

USERS GIVE  
THUMBS UP TO  
HITACHI AND  
DELL NAS

CASTAGNA:  
FIVE THINGS THAT  
SHOULD HAPPEN IN 2014

TOIGO:  
PONDERING CLOUDS,  
HELIUM AND BLACKPEARL

McCLURE:  
REIN IN SYNC AND  
SHARE, OR ELSE

MATCHETT:  
WITH APP-AWARE  
STORAGE, RAW CAPACITY  
IS SECONDARY

SNAPSHOT:  
BACKUP ANGST PERSISTS,  
BUT DEDUPE AND CLOUD  
OFFER SOME RELIEF



# The day you get back, challenges will be solutions

➤ **Storage Decisions** CONFERENCES AND SEMINARS



Storage Decisions events are guaranteed to deliver practical advice and technical guidance that you can put to use as soon as you return to the office. Featuring the world's most renowned storage experts, our events offer tips and vendor-neutral advice for tackling current issues. Our innovative vendor showcases help you avoid falling behind by providing exclusive insight into market trends and emerging technologies. Plus, only you and your true peers in IT can qualify for FREE admission, ensuring an unmatched experience at an unbeatable value.

**Visit [www.StorageDecisions.com](http://www.StorageDecisions.com) to register for an event near you.**



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

# Five things that should happen in 2014 (but probably won't)

*It's a new year and I'm kind of optimistic again, hoping 2014 brings a healthy dose of clarity and reality back to the storage market.*

**DON'T KNOW WHAT** constitutes a tradition, but in these days of instant gratification, I think doing something two years in a row qualifies. And since I wrote a [similar column last year](#) at this time, I will now present my traditional New Year's column on five things that should happen in storage in 2014 but probably won't.

Before I issue my 2014 tirade, here's a quick review of my wish list from the first annual should-happen-in-the-data-storage-market-but-won't column.

Last year I hoped for cloud storage standards (still hoping); data classification to come back into vogue (I'm still optimistic); primary storage dedupe (saw some progress); some reality-based ROI/TCO talk about virtualization (ha!); and real alternatives to RAID (can you say "erasure codes?").

In retrospect, that was a pretty modest wish list, and the potential was there for it all to happen. In a perfect world, it would have. But we don't live in a perfect world, so here I go again.

**WISH 1: Will someone please define software-defined storage?** According to my latest count, a million vendors (out of a million and one) are selling something they're calling *software-defined storage*. I'm sure they all feel very good about having a product in this new, hotly contested market—and they'd feel even better if they only knew [what the heck software-defined storage meant](#). It's been bandied about so much that it even has its own acronym: SDS (apologies to the 1960s Students for a Democratic Society; my, how an acronym can change in a mere 50 years).

HOME

FIVE THINGS THAT  
SHOULD HAPPEN  
IN 2014PONDERING CLOUDS,  
HELIUM AND  
BLACKPEARLHOW FLASHY DO  
YOU NEED TO BE?REPORTING APPS  
TAKE THE DOUBT OUT  
OF BACKUPUSERS GIVE THUMBS  
UP TO HITACHI  
AND DELL NASREIN IN SYNC AND  
SHARE, OR ELSEWITH APP-AWARE  
STORAGE, RAW CAPACITY  
IS SECONDARYBACKUP ANGST PERSISTS,  
BUT DEDUPE AND CLOUD  
OFFER SOME RELIEF

Put the names aside for a moment and just compare some of these products to see how all over the map they are. There are real software-based storage controllers capable of supporting limited amounts of storage capacity in a DIY array if you really want to scrape your knuckles and maybe lose all those tiny screws trying to put one together yourself. Then there's the software-defined storage that doesn't actually do any defining, but rather kind of redefines things and pools existing storage systems into one giant storage resource that can be managed from a single window. If that [sounds like good ol' storage virtualization](#), it's because it is. And then there's the kind of software-defined storage that sort of falls in between and if your rep convinces you to buy it, you'll spend the next year trying to figure out exactly what it does.

**WISH 2: Flash! We need some clarity about solid-state storage.** Flash is cool, quick and confusing as hell. We're a few years into the "flash in the enterprise era" and you'd think all that solid-state stuff would be more mainstream—you know, just another souped-up drive. But more and more alternatives related to form factors, placement in the storage environment and various functions are upping the confusion quotient for storage managers trying to spend their limited budgets wisely. True, it's hard to blame a technology that's just evolving real fast, but flash's growing complexity is being aided and abetted by vendors who don't want users to be able to compare

their products all that easily.

Let's face it; [all-flash arrays are still pretty exotic](#) and should probably only be considered for apps that need to go from zero to 60 in a blink of an eye. More than the performance of a little solid-state tucked into an otherwise spinning-disk array can offer—but that setup can be shared among a lot of applications pretty effectively. And dedicated solid-state storage installed directly in a server is the easiest, most expedient way to expedite a performance-hungry app. Now that I've cleared up all that solid-state confusion, vendors can do it, too.

**WISH 3: Limit vendors to only two buzzwords per product announcement.** Your product can't possibly combine big data, virtualization, software-defined storage AND the cloud. Believe the hype and you'll believe a plain old storage array is some kind of super box that can crunch through billions of bytes in a nanosecond, is so virtualized and software-defined that it's invisible, and is capable of turning your stubbornly anchored-to-the-ground data center into a fluffy cloud. I guess it's pretty easy for vendors to make those claims since all those tags defy anything remotely resembling a clear definition. But if you find yourself buying into that stuff, and you're signing on the dotted line for one of those Swiss Army knives, you may also be interested in some swampland I'm selling.

**WISH 4: Let's put the "tape is dead" talk to rest and just**



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

**admit that “tape is alive and well.”** Tape has died or teetered on the brink of death more times than Generalissimo Franco. And each time, after it’s been declared dead, some smart aleck company like Oracle, IBM, Spectra Logic, HP or Quantum comes out with some new tape technology that makes tape the highest capacity media bucket around, has it operate fast enough to give disks a run for their money, or [adds capabilities like LTFS](#) that could expand its role in the enterprise and make it a cheap alternative to spinning disk. That seems [pretty lively for a “dead” technology](#).

**WISH 5: Big backup app vendors will wake up to the perils of BYOD and provide some useful data protection tools.** Here’s my conspiracy theory: Every backup vendor and their uncle has a well-crafted, easy to implement and even easier to use mobile device backup app tucked away in a vault in an old salt mine in Nevada. They’d try to sell

you an [endpoint backup app](#) right now, but they know you’re not interested. And just how uninterested are you? Our survey data shows only 4% of you are actually backing up smartphones and tablets. A whopping 69% don’t do anything about those devices, and approximately 20% have end users do their own backups (now there’s an effective data protection policy). So backup vendors aren’t going to waste their marketing bucks just yet; they’ll wait until BYOD results in massive data loss for some unlucky company and turns it into bring your own disaster (BYO{kaboom!}). That ought to get someone’s attention.

Happy New Year, everyone; I hope your wishes come true, too. ■

---

**RICH CASTAGNA** is editorial director of TechTarget’s Storage Media Group.



# Of clouds, BlackPearl and helium

*Good-bye, or perhaps good riddance, to 2013, and welcome to a new storage year.*

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

# H

**APPY NEW YEAR!** That somewhat arbitrary placeholder means little more than an opportunity for department stores and mall kiosks to sell millions of new calendars every year. Sym-

bolically, for me at least, the date suggests that the prior year's burdens are coming to an end and we're at the beginning of an entirely new workload in the data storage industry.

I would like to think clouds are done, or at least that [variety of cloud hosting services](#) for applications and data that provide no exit strategy for customers silly enough to contract for them. Last year's [Nirvanix debacle](#) should have taught us a thing or two, or at least reinforced the view that a cloud storage service should use tape technology to keep its own costs to a minimum and to provide

a viable exit strategy for its customers. In the closing months of 2013, we saw Fujifilm, already offering its [Permivault tape cloud service](#), add its d:ternity Linear Tape File System (LTFS) tape-based storage cloud, which I hope will attract a lot of paying customers by this time next year.

We might also be close to seeing another twist on tape clouds based on the [BlackPearl Deep Storage Appliance from Spectra Logic](#), which was announced last October. BlackPearl builds both on LTFS (as a back-end file system) and Amazon's Simple Storage Service (S3) protocol for moving data into their storage clouds. Spectra Logic has augmented S3 with additional tape-related (bulk move) commands that leverage open Web services REST standards, producing a protocol the firm calls DS3 that should help move object content into LTFS repositories.

HOME

FIVE THINGS THAT  
SHOULD HAPPEN  
IN 2014PONDERING CLOUDS,  
HELIUM AND  
BLACKPEARLHOW FLASHY DO  
YOU NEED TO BE?REPORTING APPS  
TAKE THE DOUBT OUT  
OF BACKUPUSERS GIVE THUMBS  
UP TO HITACHI  
AND DELL NASREIN IN SYNC AND  
SHARE, OR ELSEWITH APP-AWARE  
STORAGE, RAW CAPACITY  
IS SECONDARYBACKUP ANGST PERSISTS,  
BUT DEDUPE AND CLOUD  
OFFER SOME RELIEF

The reason Spectra Logic prefers objects rather than files for [cloud tape storage](#), as I understand it, is that objects are what Spectra's customer base is requesting. In broadcast and media, healthcare, finance, oil and gas, and supercomputing/big data, binary object transport fits neatly into existing workflows, enabling tighter integration with infrastructure. So, BlackPearl accepts objects and writes them into LTFS for portability. I can see some interesting infrastructures being built from that technology.

Of course, 2013 saw a continued effort by the flash storage mavens to undermine disk sales, with IBM's own storage business unit boss stating publicly that [flash is the new disk](#) (perhaps to better leverage the huge amount of money spent to acquire Texas Memory Systems last year). That will likely continue this year, forcing the disk guys to up their game and move into other markets, such as archive.

As I write this, Western Digital's HGST unit has announced a 6 TB drive leveraging seven (rather than five) platters encased in a permanently and hermetically sealed case containing helium. From my conversations with Tom Coughlin, president of Atascadero, Calif.-based data storage consulting firm Coughlin Associates, and the undisputed knowledge leader in all things hard disk, it appears this is a significant advance. The old trend line showing [disk capacity improvement](#)—doubling in size every 18 months—slowed to a fraction of that last year. Adding more platters to a platform in which platter

motors don't need to work as hard (helium has less friction than normal air) produces not only more elbow room, but better power metrics. Despite neither Seagate nor Toshiba publicly announcing any interest in the technology, it could well be used in combination with shingled media or heat-assisted magnetic recording to help dissipate heat generated in exotic recording methods, Coughlin confirmed.

### **The first-generation of helium drives are aimed at "near-line" storage applications—a further attempt to dislodge tape from the archive space.**

That said, the [first-generation of helium drives](#) (operating at 7,200 rpm) are aimed at "near-line" storage applications according to Western Digital—a further attempt to dislodge tape from the archive space. This strikes me as profoundly misguided, especially given that tape is only improving as an archive medium. Oracle's StorageTek T10000D tape format, for example, already uses a Type I Barium-Ferrite coating technology (spearheaded by Fujifilm) to achieve 8.5 TB of uncompressed capacity on a single cartridge, and leverages a mature automation technology platform that is ultimately less power consumptive than any disk array, including one based on helium



HOME

FIVE THINGS THAT  
SHOULD HAPPEN  
IN 2014

PONDERING CLOUDS,  
HELIUM AND  
BLACKPEARL

HOW FLASHY DO  
YOU NEED TO BE?

REPORTING APPS  
TAKE THE DOUBT OUT  
OF BACKUP

USERS GIVE THUMBS  
UP TO HITACHI  
AND DELL NAS

REIN IN SYNC AND  
SHARE, OR ELSE

WITH APP-AWARE  
STORAGE, RAW CAPACITY  
IS SECONDARY

BACKUP ANGST PERSISTS,  
BUT DEDUPE AND CLOUD  
OFFER SOME RELIEF

drives. Additionally, Type II Barium-Ferrite is right around the corner, and we'll shortly see LTO Ultrium cartridges on the market that deliver 35 TB uncompressed capacity just for starters.

As of this writing, not a lot is known about how hermetic sealing is accomplished to keep the gas inside the new disk drives nor how a gas leak can be detected efficiently. Seems to me that leaking helium-filled drives may become just another potential risk in disk storage, but I'm

a glass half-empty kind of guy.

So, as the saying goes, out with the old, in with the new. I hope the New Year is better for you than your old year, and I'll work over the coming months to provide a useful perspective on storage trends. ■

---

**JON WILLIAM TOIGO** is a 30-year IT veteran, CEO and managing principal of Toigo Partners International, and chairman of the Data Management Institute.

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

# HYBRID vs. 100% SOLID-STATE: A LITTLE FLASH OR A LOT?

With solid-state storage prices dropping, more vendors are offering all-flash arrays; but are they really that much better than hybrid arrays?



**COMPARING TECHNOLOGY SYSTEMS** has traditionally relied on a “price-to-performance” analysis that tries to normalize system differences into an apples-to-apples comparison. With respect to storage, the [advent of flash \(solid-state\) drives](#) created a situation where IT buyers had to decide between price and performance. Flash storage offered blazing speeds, but at a very high cost per gigabyte (\$/GB). At the other end of the spectrum, multi-terabyte [hard disk drives \(HDDs\)](#) are very economical, but with just around 75 raw IOPS per drive there better not be much work in the workload if that’s where your data is located.

HDDs have an advantage in \$/GB, while flash has an advantage in \$/IOPS.

[Hybrid arrays](#) are intended to balance that equation. By adding a thin slice of flash storage to an array (i.e., 2% to 5% of total capacity), available IOPS may double and reduce read latency from 10+ milliseconds (ms) down to 3 ms to 5 ms. Even though the flash is expensive by itself,

By Phil Goodwin

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

an overall 10% to 20% increase in array price to yield a 2X performance gain adds a lot of bang to the buck.

As good as 3 ms to 5 ms latency sounds, for an increasing number of applications this variability is unacceptable. All-flash arrays can deliver sub-millisecond read latency with a guaranteed quality of service (QoS). There are no pre-fetch issues with flash and no variability between a cached read and a seek because on flash all I/Os are effectively cache reads. To put it in perspective, improving from 10 ms to 5 ms and then down to 0.5 ms is a 20X performance gain from HDD to all-flash on a latency basis. Although the [difference between HDD prices and flash](#) has narrowed considerably, most organizations still don't have the budget to deploy hundreds of terabytes of it. So, if deploying flash technology judiciously is important to an organization, knowing where the [breakpoints between hybrid and all-flash](#) will help managers to make the best decision.

### PRICE/PERFORMANCE OF HYBRID STORAGE ARRAYS vs. ALL-FLASH ARRAYS

With price-to-performance being the major consideration in storage purchases, let's examine those two areas first. When it comes to cost, it's an industry truism that the purchase price is approximately 20% of the three-year cost of ownership for conventional HDD arrays. [All-flash storage arrays](#) break this model, however, partly because the purchase price goes up but operating costs go down.

For example, Nimbus Data, a maker of all-flash arrays, estimates that its arrays use just 8 watts per TB, whereas HDD arrays may use 80 watts per TB. Moreover, Nimbus advises that users can fully populate a rack with usable space and get up to 90% utilization without performance degradation. This offers the potential for less floor space, cooling and power per TB of storage. High-capacity SATA drives offer gigabyte density, but won't meet even moderate IOPS or latency requirements. Given that flash is following the downward curve of cache memory, it's well worth the time to compare the total cost of ownership (TCO) of all-flash and hybrid storage systems.

Hewlett-Packard (HP) Co. offers a different perspective on cost metrics: \$/transaction. This metric is reflective of the true business cost, whereas \$/GB and \$/IOPS reflect purchase cost only. The \$/transaction metric can be applied irrespective of media type, making a "non-denominational" comparison between techs. High-transaction workloads may actually see a lower \$/transaction on all-flash arrays, whereas lower transaction environments may have a lower \$/transaction on hybrid storage arrays. Either way, the result is calculable and definitive.

Although it may be considered a "soft" cost, IT managers should factor in the value of the user's experience. Justifiably or not, if users perceive an application to be slow, they're more likely to have a negative perception of the IT organization or provider. It's a bit like the adage that when airline passengers find coffee stains on their tray

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

tables, they question the quality of engine maintenance. It may therefore make sense to spend a few extra dollars to improve the user's perception of quality, especially in this era of IT outsourcing.

[Deduplication and compression](#) are staples of nearly all storage systems and are frequently used to generate a \$/GB figure that's much more favorable than those based on raw capacity. However, a cautionary note is in order.

Increasingly, deduplication and single-instance storage ([SIS](#)) are taking place at the OS and application layers (i.e., VMware and SIS products for Exchange). Deduplication and compression can't occur twice on the same data, so storage managers may see less reduction than they anticipate as dedupe moves up the stack.

For the purposes of commercial computing applications, [storage performance has been all about IOPS](#) until

## Top five reasons to select a hybrid or all-flash array

### Hybrid array

- 1 Unpredictable workload characteristics
- 2 Cost-optimized storage is a priority
- 3 Variable latency isn't a problem
- 4 Environment is evolving from legacy arrays
- 5 Budget doesn't permit all-flash implementations, but more performance is needed

### All-flash array

- 1 Sub-millisecond latency is required
- 2 Guaranteed Quality of Service is required
- 3 Performance-optimized storage is a priority
- 4 Flash capacity requirements exceed flash-tier maximums
- 5 Consolidating sparsely populated, high-performance hard disk drives to get lower TCO

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

very recently. Perhaps this was because storage arrays inherently couldn't guarantee a specific QoS. All-flash arrays change that game, and SolidFire promotes its flash arrays squarely as [storage QoS delivery vehicles](#). SolidFire allows IOPS to be provisioned on a per-volume basis with minimum, maximum and burst parameters. This throttling, along with dynamic adjustment, gives storage managers an additional mechanism for precisely delivering performance where it's needed. SolidFire also suggests that guaranteed QoS solves the "noisy neighbor" problem. For example, in a typical hybrid array, applications may compete for the flash tier of storage based on data access, resulting in oversubscribed flash and sub-optimal performance for all applications. Allocating IOPS to each application specifically solves this problem.

### EITHER OR BOTH?

Established vendors have extended their traditional HDD products to embrace flash technology, often with hybrid devices and all-flash units. IBM, EMC Corp., NetApp Inc. and HP each offer an "all of the above" portfolio, though the specific implementations differ in important ways.

IBM has extended its SAN Volume Controller (SVC) virtualization capability to manage "fit for purpose" all-flash devices such as the [FlashSystem family](#) or hybrid arrays in its XIV Storage System, Storwize and DS product lines. Because all devices can be managed through SVC, IBM extends the concept of hybrid to not only arrays, but

the enterprise storage ecosystem. The intent is to allow ultimate flexibility in deploying both combinations of media, as well as combinations of arrays for scale and performance where needed.

[EMC's VMAX](#) can virtualize hybrid and all-flash systems into a single ecosystem. Its VMAX, VNX, VNXe and Isilon products can also be configured as either hybrid

### Established vendors have extended their traditional HDD products to embrace flash technology, often with hybrid devices and all-flash units.

or all-flash. Thus, users can enter at any point and evolve the solution as requirements change over time. In addition, the company's [XtremIO arrays offer an all-flash solution](#) from the ground up. Because it doesn't necessarily have to separate its hybrid and all-flash offerings, EMC views the market more horizontally. That is, it can offer traditional HDD arrays to the more budget-conscious buyer, hybrid configurations to those needing more performance and all-flash for situations that demand guaranteed QoS. Which product line will be recommended is determined by Reliability, Availability and Serviceability (RAS) requirements, with customers needing up to "six

HOME

FIVE THINGS THAT  
SHOULD HAPPEN  
IN 2014PONDERING CLOUDS,  
HELIUM AND  
BLACKPEARLHOW FLASHY DO  
YOU NEED TO BE?REPORTING APPS  
TAKE THE DOUBT OUT  
OF BACKUPUSERS GIVE THUMBS  
UP TO HITACHI  
AND DELL NASREIN IN SYNC AND  
SHARE, OR ELSEWITH APP-AWARE  
STORAGE, RAW CAPACITY  
IS SECONDARYBACKUP ANGST PERSISTS,  
BUT DEDUPE AND CLOUD  
OFFER SOME RELIEF

nines” of availability choosing VMAX, regardless of hybrid or all-flash provisioning.

[HP's 3PAR](#) similarly offers everything from all-HDD to hybrid to flash configurations, but with some interesting wrinkles. HP offers both single-level cell and

### Although most vendors support conventional RAID techniques for flash, RAID use can extract a price in capacity terms as well as processing overhead just as it does for HDDs.

multi-level cell flash in the same arrays. The company recommends using the caching layer for writes and the flash tier for reads. This builds upon its [Adaptive Optimization software](#) that enables sub-LUN tiering. 3PAR's OS has a built-in clustered volume manager and virtual memory implementation that seamlessly virtualizes all media types, including new media.

[NetApp offers flash](#) across its entire portfolio of FAS, V-series and E-series arrays; the EF540 is an all-flash system. NetApp usually [recommends Flash Pools](#) in its arrays with 1% to 2% of total capacity in flash. The company suggests that typical workloads, such as email, Web serving, app dev and collaboration are best served with

hybrid configurations. In these use cases, workloads require less than 150,000 IOPS and can tolerate 3 ms to 5 ms of latency. For higher IOPS workloads or where QoS demands sub-ms latency, all-flash is prescribed.

[Oracle's ZFS Storage ZS3](#) are hybrid arrays, but the company says users may get up to a 90% data hit rate using its flash/DRAM architecture and sub-ms latency on those reads. Moreover, the company touts a significant cost advantage over competitive all-flash systems. Thus, users may get near all-flash performance at a hybrid price. Oracle's Hybrid Storage Pool dynamically and automatically moves data across DRAM, read-flash and write-flash to optimize array performance.

### RAID CONSIDERATIONS

[Flash devices need to be protected by RAID](#) just like any other storage media. Although most vendors support conventional RAID techniques for flash, RAID use can extract a price in capacity terms as well as processing overhead just as it does for HDDs. IBM addresses this issue with “variable stripe RAID” in its FlashSystem technology where RAID 5 is built into the flash controller. The result is [parity-based RAID](#) at line speed with the workload distributed across controllers. NetApp deploys Dynamic Disk Pools in its SANtricity (E-series) software that distributes data, parity and spare capacity across drives. NetApp claims this speeds recovery of failed drives while maintaining greater performance. Nimbus uses a

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

RAID 5 algorithm designed to avoid the wear penalty associated with writing to flash.

### **SOME AGREEMENT ON GUIDELINES**

Despite differences in architectures, the vendors generally agree on some [hybrid vs. all-flash guidelines](#). First, if sub-ms or guaranteed QoS is required, then all-flash arrays are the way to go. Or, in the case of Oracle, a hybrid that can deliver near all-flash performance. QoS application candidates include e-commerce where user experience is paramount and decision support analysis where

time is of the essence. Second, if variable and unpredictable workloads are to be serviced, hybrid devices can often serve the need at a lower \$/GB. Nimbus, SolidFire and other all-flash vendors may have different answers to this rule of thumb that do indeed have interesting price/performance characteristics and may have a \$/IOPS advantage. Application candidates in this area include collaboration, email and anything where data lifecycle issues mean that not all data requires immediate access. ■

---

**PHIL GOODWIN** is a storage consultant and freelance writer.

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

# BACKUP: SUCCESS OR FAILURE?

Sometimes, a failed backup isn't detected until an attempt to recover the data fails. But new data protection management tools can provide early warnings about gaps in the data protection process.

**BACKUP IS A** fundamental responsibility of every data center or storage manager. But as the storage environment being protected becomes more diverse, it's difficult to ensure that the data on every system has been backed up successfully. Given the critical nature of most systems, managers need to know quickly if there's a problem in the data protection process. To meet this need for timely and accurate backup status information, a new class of software offerings—known as data protection management (DPM)—is emerging that promises to not only sound an alert the moment a backup fails but provide guidance as to how to fix the problem.

## CIO ENLIGHTENMENT

While backup operations may be relegated to a system administrator, it's still important for CIOs and other higher-level data managers to know what's going on with their data protection process. Ultimately, if data can't be

By George Crump

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

recovered, those managers are the ones who will be expected to provide an explanation for the failure.

The challenge today is that expectations are at a very high level. Executives and business-line managers assume IT infrastructures will be 100% available, making [uptime of five nines \(99.999%\)](#) a thing of the past. There's also the expectation that data will be recovered instantly from almost any point in time with limited details on what that data is.

## The ROI of data protection management

- **Service-level agreement (SLA)-focused data protection** will report on the health of the business application not the data protection tool.
- **Reduce backup resource consumption** to fine tune and even eliminate backup jobs to save backup storage capacity.
- **First things first.** The primary need is to identify the backup failures putting SLA attainment at risk.

Because of these expectations, a CIO needs up-to-date, almost real-time information about their shop's data protection process as a whole. Consequently, the first key deliverable of a data protection application is to provide CIO-level visibility into the backup process. Typically, this means an overview of the success or failure of each system's backup.

The problem is that in most enterprises the backup process will generate a failure of some sort almost every night. But many of these failures don't mean data is at immediate risk; rather, it could indicate the process may be heading that way if left uncorrected. The CIO needs to know specifically when the data risk is serious enough that IT may not be able to [meet its data availability commitment](#) to users. In other words, data protection management tools should provide CIO-level reporting functions that can be aligned with the service-level agreements (SLAs) IT has established with the company's lines of business.

### IT'S ALL ABOUT SERVICE LEVELS

What [qualifies as a successfully completed backup](#) varies among applications and data sets. For some applications, success may simply be a [second copy on another disk backup device](#); for others, it may mean [data is copied to tape media](#). And for many others, a backup job may not be successfully completed until the [data is copied to a remote location](#) outside the data center.

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

These varying levels of what qualifies as success is what make up the various service levels in the environment. It's important that a data center not establish a one-size-fits-all approach to backup SLAs. They should differ according to the needs of the applications and business groups that own them; a [backup management tool](#) allows management of the process specific to those SLAs.

## Data protection management offerings have evolved beyond just reporting if individual jobs have passed or failed, and can now alert managers to which service levels are in jeopardy of not being met.

Some data centers may treat all data the same and manage their backup process based on a single SLA because they don't have the ability to manage to a specific SLA.

Another service-level criterion may specify the [time between successful backup events](#). For example, for some data sets merely getting a good secondary copy every few days may be acceptable. Other applications may need this secondary copy once a night, and a few applications may need a smaller window between successful data

protection events.

Those are just two common examples of service levels, either implied or formally defined, that a data center operations team has to adhere to. [Data protection management offerings](#) have evolved beyond just reporting if individual jobs have passed or failed, and can now alert managers to which service levels are in jeopardy of not being met.

That's an important feature because in an enterprise backup there can be dozens of failures recorded each night with only a limited time to fix them prior to the start of the production day. A backup administrator must be able to prioritize which failures are important enough to address first.

### MORE THAN JUST A SINGLE APPLICATION

The overwhelming majority of enterprises run more than just one backup application. A common practice is to have one backup application that's used to [protect the virtual server environment](#) and a legacy application that protects the physical environment. Additionally, there might be a mix of backup software as a result of a merger or acquisition, especially when there were different standards for data protection in the merging companies.

Companies often also make data protection decisions along operating system lines. For example, they may choose one application to back up Windows servers, another for servers running Linux and still another for

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

legacy Unix operating systems. Finally, they may make these decisions based on the needs of the production application itself. For example, some backup apps have unique features when it comes to protecting Oracle, Exchange, SQL Server or SharePoint applications.

While the legacy data protection applications eventually narrow the gaps in coverage or capabilities, the reality is that once an application makes it into the environment it can be very difficult to replace or remove, even if its replacement is another product that's already used by the organization.

Most data centers use a variety of applications and storage system features, like snapshots, to meet service-level commitments to different lines of business. Those business groups don't necessarily want to know how their data protection SLA is being met on an application-by-application basis. Instead, they need to know whether the data protection process as a whole is meeting their SLA. For that reason, it's important that the data protection management application combine its monitoring of multiple applications into a single report that signifies SLA attainment.

### MORE THAN HIGH-LEVEL SUMMARIES

While the summary is important for CIOs and other management-level IT staff, most organizations want their [data protection management tool](#) to empower the backup team to do their jobs better and more efficiently. The

## Sampler: Multi-platform data protection management reporting tools

- **Aptare Inc.'s StorageConsole Backup Manager.** This backup management tool features media forecasting, job summary across backup applications, backup detail reporting, device performance reporting, billing and chargeback.
- **Bocada vpConnect.** Bocada Inc.'s data protection management (DPM) tool consolidates virtual and physical reporting and includes support for new virtual-only backup apps, virtual machine data protection gaps, snapshot capacity utilization, trouble ticket integration, executive roll-up reports and service-level agreement-specific adherence reporting.
- **EMC Data Protection Advisor.** EMC Corp.'s DPM app provides reporting across data protection functions, including replication. It also offers cross-platform monitoring, alerts, optimization, and capacity planning and reporting.

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

backup team works in the data protection trenches, and needs a more granular level of reporting that will enable them to optimize the backup process so it can be completed faster and more consistently while using fewer resources. A data protection monitoring tool delivers just that kind of information.

### **MORE THAN JUST ERROR CODES**

A data protection management tool that provides the kind of granular detail a backup administrator needs must go beyond simply reporting on what went wrong. Many of these offerings are now leveraging a knowledge base that [maps the error code to a particular error](#) along with the specific process the backup environment was involved with prior to the error occurring. These tools can then apply that combined knowledge to provide admins or managers with a natural language explanation of what the error actually means. Some tools can even take that information and generate potential solutions to the problem or recommend changes to the environment to prevent its recurrence.

If a data protection management product has the ability to “humanize” these error codes and provide a root-cause analysis, it will pay for itself very quickly. That kind of information could save backup administrators upwards of a few hours every day chasing down error codes, and allow them to figure out how to resolve the problem more quickly.

### **MORE THAN JUST TROUBLESHOOTING**

While fixing problems is initially the primary function of a data protection management tool, helping to [optimize backup storage resource utilization and performance](#) is another very valuable benefit. The error reporting and troubleshooting assistance described above should relieve backup administrators of tedious error-checking chores and leave them with more time to focus on optimization.

**A data protection management tool that provides the kind of granular detail a backup administrator needs must go beyond simply reporting on what went wrong.**

Data protection management tools have the ability to report on backup space utilization. They can, for example, report on a per-application basis how much capacity is being consumed by the backup. More importantly, they can do this reporting by job, so the backup team is able to see which backup jobs use the most resources. At the same time they can indicate the retention setting of those jobs. Minor adjustments in the number of full backups retained can make a dramatic difference in the amount of backup capacity consumed.



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

Another data protection management capability is reporting on the capacity consumed per business-line app across backup systems. For example, DPM tools can show all the protection being applied to the same Oracle database. It's not uncommon to see the exact same data set protected multiple times across multiple apps. Using a data protection management solution to eliminate redundant jobs can dramatically reduce network bandwidth requirements and backup storage space requirements.

A DPM app can also lead to better use of primary storage capacity. A few DPM apps can even map the storage of hypervisor-based snapshots into the overall data protection snapshot quantities. This could lead to a reduction in the number of snapshots taken or retained, and free valuable primary storage capacity.

## BOTTOM LINE ON BACKUPS

[Data protection monitoring and management](#) is among those few applications that are as valuable to a CIO as they are to a system administrator. The ability to provide high-level data backup success reporting plus resource utilization gives a CIO confidence in their backup infrastructure because they know it can fulfill its mission when called upon. It also provides backup administrators with the tools they need to eliminate backup failures and improve backup performance. Data protection management should be considered a “must have” for enterprises in 2014. ■

---

**GEORGE CRUMP** is president of Storage Switzerland, an IT analyst firm focused on storage and virtualization.

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

# USERS RATE DELL AND HITACHI AS TOP NAS VENDORS

Our eighth Quality Awards service and reliability survey for NAS systems yielded two sweeping performances—Dell cruised through the enterprise group while Hitachi cut a similar swath among its midrange peers.



**STORAGE MANAGERS TRYING** to dig their way out from growing piles of file data might hate the fact that they need to [buy another network-attached storage \(NAS\) box](#). But their hate quickly turns into the closest thing to love you'll find in a data center when they actually get that new NAS up and running.

Over the past eight years, our Quality Awards survey measuring user satisfaction with NAS storage products has yielded some of the highest scores among all categories. The latest crop of evaluations continues this trend, with Dell Inc. grabbing its first win for best NAS storage and emerging as the favorite among enterprise-class NAS systems; Hitachi Data Systems Corp., often considered an enterprise vendor, topped the midrange group for the [second year in a row](#).

There were seven product lines qualifying in each group. This year's survey had 403 valid responses offering 594 product evaluations.

By Rich Castagna

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

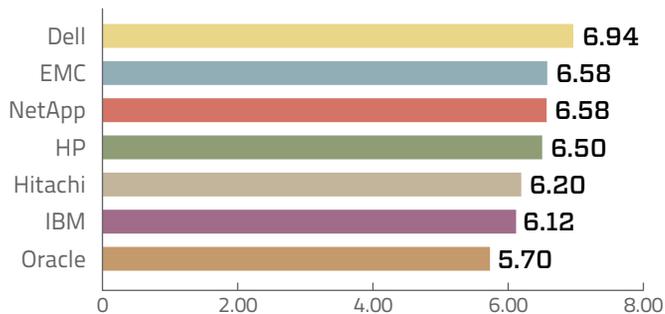
BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

## Overall Ratings

**Enterprise.** Dell had never come out on top in either the midrange or [enterprise NAS](#) groups, but this time it earned top honors in a particularly impressive fashion with the second-highest overall score ever for enterprise NAS products (6.94). That exceptional score was achieved by leading the field in all five rating categories, highlighted by a couple of marks of 7.00 or better for reliability and technical support. But as we've seen in the past, the winner's fine showing was complemented by solid scores among the other six vendors, with EMC Corp. and NetApp Inc.—two stalwarts of enterprise NAS—tying for second with identical scores of 6.58, followed by Hewlett-Packard (HP) Co. (6.50). Midrange winner Hitachi had less success in this group, but still finished with a more than respectable 6.20.

**KEY STAT:** 5 of the seven enterprise NAS entries scored at least 6.00 in all five categories.

### ENTERPRISE NAS: OVERALL RATINGS

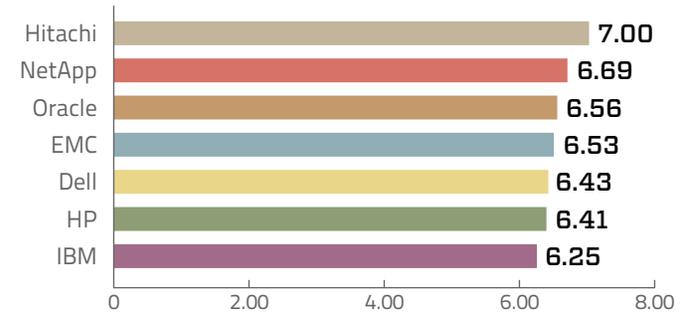


**Midrange.** Hitachi prevailed in the [midrange NAS](#) group last year with a near-7.00 performance, and repeats as a winner this year—attaining the elusive 7.00 level by notching two 7.00-plus category scores and bolstering them with

**KEY STAT:** The mid-range group's overall average of **6.55** was the third best ever, highlighted by strong ratings for features and reliability.

three scores ranging from 6.89 to 6.98. It's a showing that's as impressive for its consistency as it is for the high bar it set for the group. And the group did very well, providing ample competition without a single category score below 6.00. Second-place NetApp was a model of consistency with scores ranging from 6.56 to 6.79 that helped build its overall score of 6.69. Not far off that pace was Oracle Corp. (6.56) and EMC (6.53). Dell's 6.43 placed it fifth, followed by past winners HP and IBM with more than respectable scores.

### MIDRANGE NAS: OVERALL RATINGS



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

## Sales-Force Competence

**Enterprise.** Sales-force competence measures how well vendors set the table before they serve up storage in a data center. Dell came out on top by a slim margin over EMC (6.78 to 6.69) by scoring highest on four of the six category rating statements. EMC and Hitachi each had top marks for one statement. Dell scored strongly for having flexible sales reps (7.00) and a knowledgeable sales support team (6.93), and had a couple of 6.70s for keeping customers' interests foremost and being knowledgeable about their industries. EMC outscored the field when it came to understanding customers' businesses (6.58), while Hitachi's leading mark was a 6.91 for reps who are easy to negotiate with. Hitachi's rating of 6.64 was its highest category score.

**KEY STAT:** The enterprise NAS vendors as a group had their best overall mark—**6.57**—for knowledgeable sales support teams.

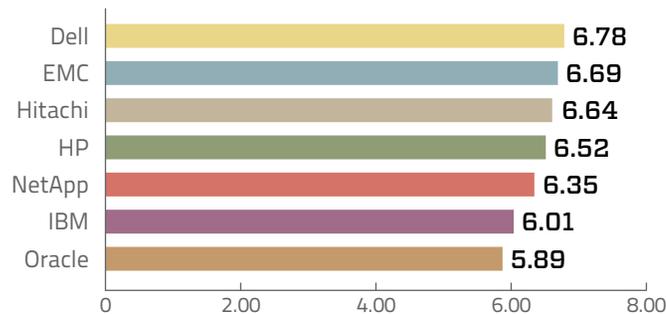
**Midrange.** Hitachi's march through the midrange ranks began with a stunning 7.14 for sales-force competence, the second highest mark ever for this category. Hitachi earned 7.00-plus marks for all six statements, with exceptional grades of 7.33 for "My sales rep understands my business" and 7.32 for having a knowledgeable sales support team.

EMC's 6.82 ranked among the highest scores we've seen, but was only good for second place in the context of Hitachi's performance. EMC was the only other vendor to achieve a 7.00-plus mark, with a 7.06 for its knowledgeable sales support team.

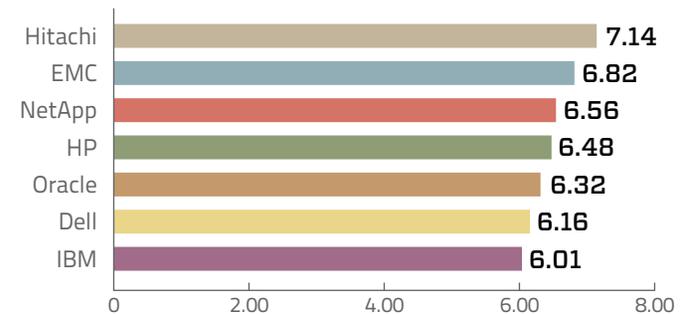
**KEY STAT:** The midrange group's average score of **6.50** for sales-force competence is the highest recorded to date.

NetApp also did well for that statement (6.85) en route to a category average of 6.56 for third place. Oracle and Dell fared well, with all their ratings topping 6.00.

### ENTERPRISE NAS: SALES-FORCE COMPETENCE



### MIDRANGE NAS: SALES-FORCE COMPETENCE



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

## Initial Product Quality

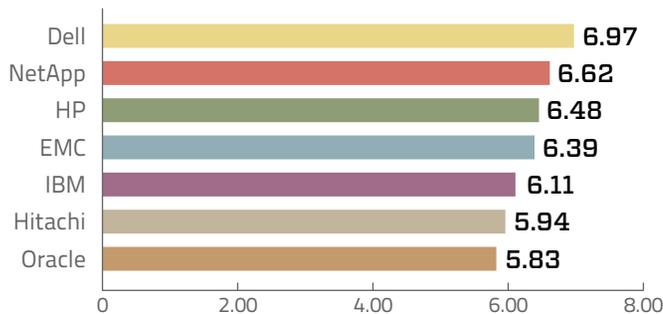
**Enterprise.** Dell once again flirted with the 7.00 category mark, but had to settle for a still outstanding 6.97, which it achieved by getting top scores for all six statements in this category. Dell picked up a 7.07 for the key statement “This product delivers good value for the money,” and a 7.02 for

**KEY STAT:** NAS vendors and users should be pleased that the best average statement score for the enterprise group was a **6.50** for ease of use.

ease of use. NetApp followed Dell with a 6.62 category score, with its best marks coming for satisfaction with the level of professional services required (6.77) and “This product was installed without any defects” (6.70). HP copped third place for

initial product quality, with very good ratings for ease of use (6.70) and delivering good value for the money (6.52). EMC also had all 6.00-plus scores, with its best—a 6.50—coming for ease of use.

### ENTERPRISE NAS: INITIAL PRODUCT QUALITY



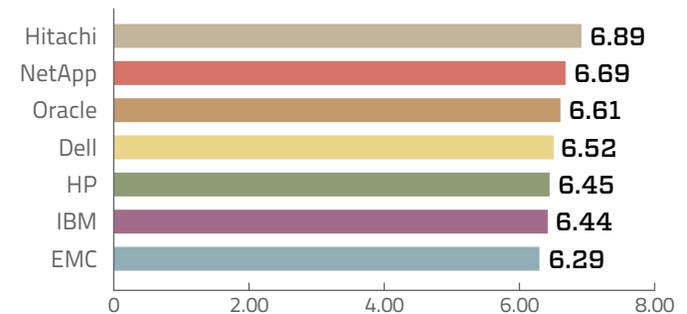
**Midrange.** Midrange NAS vendors apparently make good first impressions, as all our entries garnered solid scores in the initial product quality category. Hitachi continued its dominance with a group-leading 6.89, featuring a 7.17 for “This product was installed without any defects” and a

**KEY STAT:** The best average score for all midrange NAS products was a **6.64** for products that install without any defects.

7.06 for not surprising users with the level of professional services required. Hitachi also picked up a 6.94 for products that require very little vendor intervention and had the highest marks on five of the six category statements, with third-place Oracle prevailing on the other with a

6.75 for ease of use. Sandwiched in between, NetApp rode a 6.69 category score into second place, featuring a 6.95 for installing without defects. Every product had marks of at least 6.12 on all the rating statements in the category.

### MIDRANGE NAS: INITIAL PRODUCT QUALITY



## Product Features

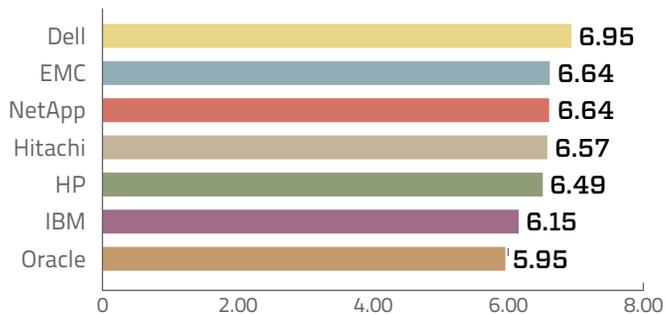
**Enterprise.** Dell's lowest mark in the product features category was 6.71 for interoperability, but it was still good enough to beat the other six vendors. The firm's best scores were for snapshot features (7.10) and [scalability](#) (7.07); it also received a 6.90 for replication features, 6.93

**KEY STAT:** With so much concern about growing data stores, this group's best average was a **6.63** for scalability with all products scoring a 6.08 or higher.

for the statement "Overall, this product's features meet my needs" and another top grade for management (6.98). In all, Dell snagged six of the seven rating statements, with Hitachi posting a sterling 7.00 for the seventh statement on mirroring features. NetApp and EMC tallied identical 6.64s to finish in

a second-place tie to Dell's category-leading 6.95. Hitachi (6.57) and HP (6.49) were just behind the leaders as the group turned in another solid set of scores.

### ENTERPRISE NAS: PRODUCT FEATURE

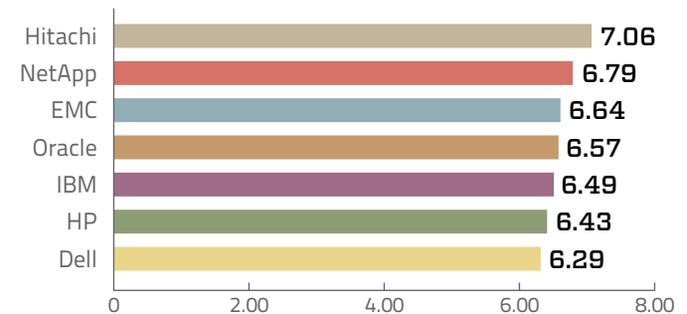


**Midrange.** Hitachi secured its second 7.00-plus category score with 7.06 for product features—the third highest for this category ever. Hitachi came out on top for all seven statements in the category, paced by five scores of 7.00 or better, including a dazzling 7.35 for mirroring features, along with excellent results for snapshots and remote replication (7.19 for both), management features (7.00) and a 7.11 for the bellwether statement "Overall, this product's features meet my needs." The rest of the products were hardly slouches, as all received excellent ratings. NetApp's 6.79 was good for second place; living up to its reputation, it copped a 7.00 for snapshot features, along with a pair of 6.94s for mirroring and an overall feature set that meets users' needs.

**KEY STAT:** Data protection is key and our midrange group delivers, with averages of **6.72** and **6.68** for mirroring and snapshots.

for the statement "Overall, this product's features meet my needs." The rest of the products were hardly slouches, as all received excellent ratings. NetApp's 6.79 was good for second place; living up to its reputation, it copped a 7.00 for snapshot features, along with a pair of 6.94s for mirroring and an overall feature set that meets users' needs.

### MIDRANGE NAS: PRODUCT FEATURES



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

## Product Reliability

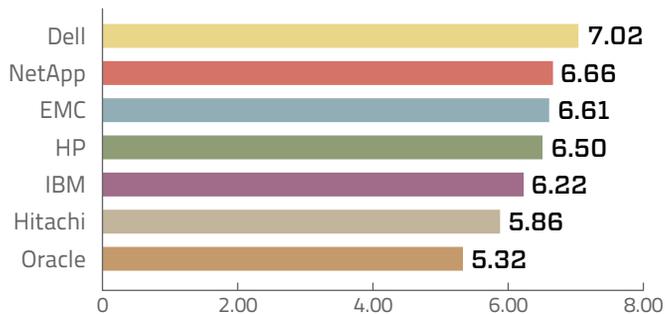
**Enterprise.** Dell posted its first 7.00-plus category rating for reliability with a 7.02, achieved once again by earning top grades on all five category statements. For three of those statements, Dell snapped up scores above 7.00—

**KEY STAT:** The **7.02** earned by Dell for reliability is the second highest score for enterprise NAS registered in eight years of surveys.

7.14 for meeting service-level requirements, 7.07 for requiring few unplanned patches and a 7.05 for products that experience very little downtime. NetApp (6.66) nudged out EMC (6.61) for the second spot; NetApp landed a couple of 6.74s for the service-level and down-

time statements; EMC's strong suits were for the same statements—6.76 for very little downtime and 6.68 for meeting service levels. HP (6.50) ran a fairly close fourth, joining the three leaders as the only products to score 6.00 or higher for all the category statements.

### ENTERPRISE NAS: PRODUCT RELIABILITY



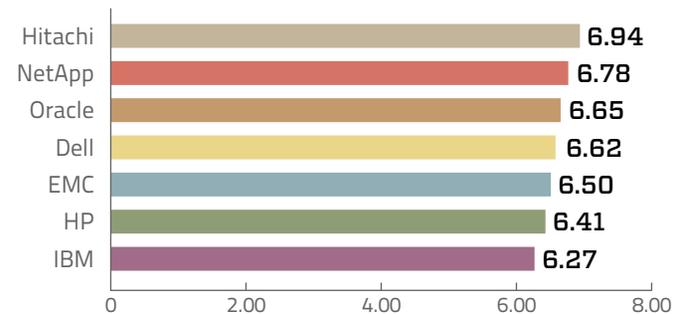
**Midrange.** Hitachi prevailed on four of the five statements in the product reliability rating category en route to a leading tally of 6.94. Hitachi's 7.17 for "The product meets my service-level requirement" demonstrates that its products do a good job of meeting expectations, while a 7.06 for

**KEY STAT:** The mid-range vendors group had their highest group average—**6.81**—for products that experience very little downtime.

very little downtime suggests the firm delivers consistently. Hitachi also led for providing comprehensive upgrade guidance (6.94) and patches that can be applied non-disruptively (6.67). The fifth statement, "This product requires very few unplanned patches,"

was won by second-place NetApp with a 6.90—but NetApp did even better on the downtime (6.95) statement. Oracle (6.65) nosed out Dell (6.62) for fourth, also doing well for meeting service levels (6.82) and very little downtime (6.81).

### MIDRANGE NAS: PRODUCT RELIABILITY



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

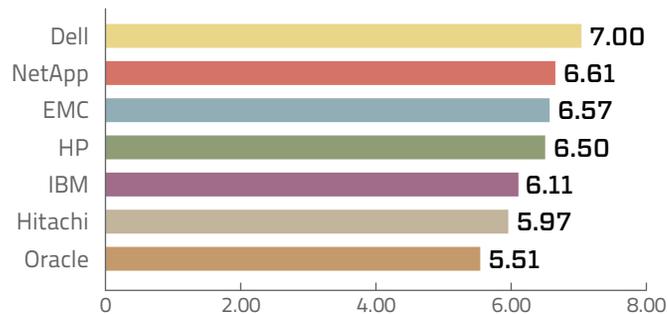
BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

## Technical Support

**Enterprise.** Dell earned its second 7.00 category score for technical support, a category that has proven to be a maker/breaker for many vendors on past surveys. Once again, Dell was dominant, winning seven of eight statements and with five 7.00-plus scores. Dell's customers gave the vendor two 7.21s for supplying support as contracted and resolving problems in a timely manner. Dell also stood out for having knowledgeable support staffers (7.19), taking ownership of problems (7.05) and for issues that rarely require escalation. Dell's only "loss" was by a whisker—6.63 to third-place EMC's 6.64 for the statement "The vendor provides adequate training." NetApp's 6.61 category rating earned it second place between Dell and EMC.

**KEY STAT:** Dell's **7.00** rating for technical support marks only the third time that level has been achieved among enterprise NAS products.

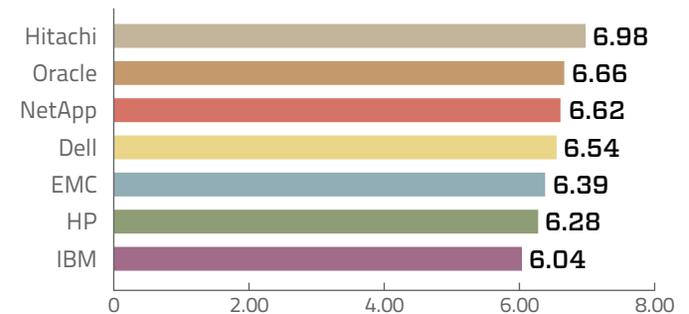
### ENTERPRISE NAS: TECHNICAL SUPPORT



**Midrange.** Hitachi topped off its romp through the mid-range rating categories with a 6.98 for tech support, built on five grades of 7.00 or better. Hitachi was high scorer on all eight statements, although Oracle managed to slow down the juggernaut a bit by tying Hitachi for providing adequate training (6.67). Hitachi's best showing was for having knowledgeable third-party support partners (7.14), along with a couple of 7.11s for delivering support as contracted and taking ownership of issues, and a brace of 7.00s for timely resolution of problems and knowledgeable support personnel. Oracle's top grade was for knowledgeable support people (6.94). Excellent tech support can make up for some of the less pleasing experiences a user may have, so the 6.50 overall average our vendors chalked up is good for users.

**KEY STAT:** Hitachi's midrange NAS tech support score of **6.98** bettered last year's 6.92.

### MIDRANGE NAS: TECHNICAL SUPPORT



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

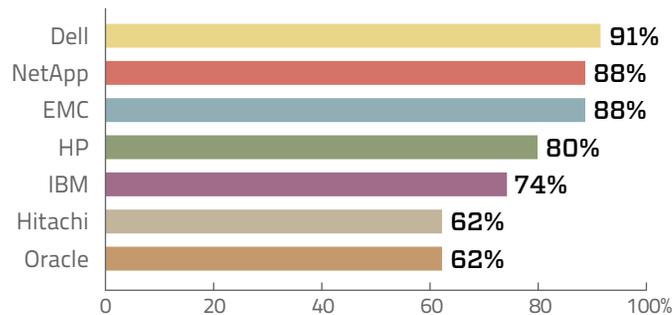
BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

## Would you buy this product again?

After responding to the detailed statements in the rating categories, we ask our survey respondents a simple question: Based on what you now know, would you buy this product again? Sometimes, the results are surprising and run counter to the other evaluation criteria; in other surveys, the buy-again question appears to confirm the respondents' other ratings.

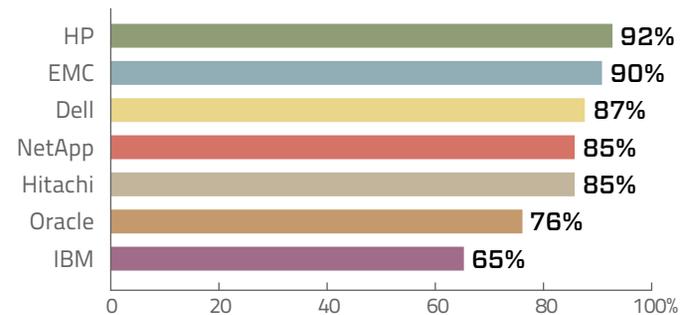
**Enterprise.** The buy-again results jibed almost exactly with the category ratings as the top four finishers ended up with the top four sets of buy-again percentages. Dell continued its winning streak, with 91% of its users saying they would pony up their bucks again. NetApp and EMC once again tied for second, with 88% of their users voting to buy their products again. And HP mirrored its fourth-place finish with an 80% buy-again rate.

### ENTERPRISE NAS: WOULD YOU BUY THIS PRODUCT AGAIN?



**Midrange.** The midrange group produced one of those head-scratching anomalies as Hitachi, which cruised through the tough category ratings, failed to land on top for the buy-again question. Overall sixth-place winner HP may have the most loyal users as 92% said they would buy their HP NAS again; EMC (90%) and Dell (87%) ranked next, followed by NetApp and Hitachi tied at 85%. These are all solid percentages, bolstered by strong category scores.

### MIDRANGE NAS: WOULD YOU BUY THIS PRODUCT AGAIN?



**RICH CASTAGNA** is editorial director of TechTarget's Storage Media Group.

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

## About the survey

The *Storage* magazine/SearchStorage.com Quality Awards are designed to identify and recognize products that have proven their quality and reliability in actual use. The results are derived from a survey of qualified *Storage*/SearchStorage.com readers who assessed products in five main categories: sales-force competence, product features, initial product quality, product reliability and technical support. Products are rated on a 1.00 to 8.00 scale, where 8.00 is the most favorable score. This is the eighth edition of the Quality Awards for NAS systems; there were 403 valid responses to the survey providing 594 sets of ratings for vendors' products/product lines.

**Products in the survey:** These products were included in the Quality Awards for NAS survey. The number of responses for each finalist is shown in parentheses.

### ENTERPRISE NAS

- DataDirect Networks Inc. NAS Scaler/GRIDScaler/EXAScaler\*
- Dell Inc. PowerVault NS-480, Compellent FS8600 (NAS), EqualLogic FS7500/FS7600 (NAS) (44)
- EMC Corp. VNX 5000/7000/8000 NAS or Isilon X-Series (108)
- Hewlett-Packard (HP) Co. StoreEasy 3000/5000 or StorageWorks EFS Clustered Gateway or StorageWorks X5000/X9000 Storage Systems (25)
- Hitachi Data Systems Corp. Essential NAS Platform 1000 Series or HNAS Platform 3000/4000 Series (13)
- IBM N6000/N7000, Scale Out Network Attached Storage (SONAS) or Storwize V7000 Unified (23)
- NetApp Inc. FAS6000 (with NAS interface) (50)
- Oracle Corp. Sun Storage 74xx Unified Storage System (with NAS), Pillar Data Systems Axiom NAS or Oracle ZFS Storage ZS3-4 (13)
- Panasas Inc. ActiveStor 9 Series/11 Series/12 Series/14 Series\*

\* RECEIVED TOO FEW RESPONSES TO BE INCLUDED AMONG THE FINALISTS

### MIDRANGE NAS

- Coraid Inc. ZX\*
- Dell PowerVault NX Series (52)
- EMC VNXe 3000/5000 Series NAS, Isilon S-Series (50)
- Hewlett-Packard StoreEasy 1000 Storage, StorageWorks X300/X500 Data Vault, X1000/X3000 Network Storage Systems (25)
- Hitachi HUS 100 Series with NAS Option, HNAS AMS2000/1000/500/200, WMS100 with NAS Option (20)
- IBM N3000/N5000 (17)
- NetApp FAS2000 or FAS3000/3100 (all with NAS interface) (109)
- Oracle Sun Storage 71xx/72xx/73xx Unified Storage System (with NAS) or Oracle ZFS Storage ZS3-2 (13)
- Overland Storage Inc. SnapServer DX1/DX2/210/410/N2000/SnapScale X2/X4\*
- Panasas ActiveStor 7 Series/8 Series\*
- Silicon Graphics International Corp. SGI NAS/SGI InfiniteStorage File Serving series\*
- Synology Inc. RackStation RS3412 Series\*



# Rogue online file sharing poses a real threat

*A surprising number of firms suspect employees of using consumer online file-sharing products on work devices to store and share sensitive data.*

**H**OW DANGEROUS ARE rogue consumer online file-sharing services when introduced to a company? That all depends on the files: sensitive or not, regulated or not, critical or not. When Enterprise Strategy Group (ESG) set out to interview IT managers on the [trend known as shadow IT](#), the results were unnerving. Many of the companies surveyed, even those in heavily regulated industries, have employees who [use personal file-sharing services](#) outside of those approved and managed by their IT departments. Worse yet, they're storing sensitive information—subject to regulatory and compliance laws—in those services.

ESG defines the [online file-sharing \(OFS\) market](#) as products that help customers share, access or collaborate on documents or files shared in a public, private or hybrid

cloud, or over the Internet. This includes products such as Box, Citrix ShareFile, Dropbox and EMC Syncplicity, and ESG is tracking as many as 60 products in the quickly growing market segment.

We surveyed 250 IT professionals responsible for the operation, management and protection of unstructured data and collaboration platforms—such as shared file servers, NAS systems or Microsoft SharePoint—in industries subject to government regulation. The goal was to understand the regulatory environment these companies face, their propensity for using a public, cloud-based offering versus hybrid or on-premises solutions, and how prevalent shadow IT is.

## REGULATORY OVERSIGHT AND REALITY

While regulatory requirements vary significantly by

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

industry, more than half the companies ESG surveyed are subject to Health Insurance Portability and Accountability Act (HIPAA) and/or Sarbanes-Oxley regulations. Other regulations, such as the Federal Information Security Management Act (FISMA), Payment Card Industry Data Security Standard (PCI DSS) and the Personal Information Protection and Electronic Documents Act (PIPEDA) also apply, as do a number of industry-specific requirements. Most of the companies surveyed have undergone at least one regulatory audit within the past five years; one-third of respondents have been audited at least five times over the past five years, and one-third of all respondents have failed audits. It's clear that these companies are under pressure to meet strict compliance regulations.

Given the rate of regulatory oversight, it's not surprising that most of these companies have a formal [policy against using personal file-sharing services](#) for corporate data; not surprisingly, we see a much higher percent of companies in this market with policies prohibiting personal accounts vs. an earlier broad market survey.

Yet despite the oversight, nearly two-thirds of the organizations surveyed either know (32%) or suspect (28%) that rogue consumer online file-sharing services are being used within the company.

That's not the scariest part. When ESG asked how likely it is that one or more employees are storing sensitive data in rogue accounts, 62% of respondents said it's

either likely or very likely. When asked how likely it is that one or more employees are storing regulated data in rogue consumer accounts, 69% said that it was likely or very likely. In fact, only 6% said it's not at all likely. That's just terrifying.

Imagine the regulated information—such as banking, health or credit card data—that could be floating around in someone's personal Dropbox or SugarSync account. And because that data is stored in personal and not corporate accounts, it leaves with the employee should they depart the company ... with IT none the wiser. In addition, the data would be accessible from any number of devices that the employee (or their family members) may use with their personal file-sharing service.

### WHY FORMALIZING FILE SHARING MAKES SENSE

Obviously, policies that prohibit storing sensitive data in personal OFS accounts don't work. That means it's imperative for IT to find an alternative approach to storing sensitive or regulated data in personal OFS accounts. There's a clear need for online file-sharing tools and strategies in organizations such as these; otherwise, the reported numbers would be lower. So it's important for IT organizations to roll out a corporate alternative to meet employee requirements.

We're beginning to see that trend develop. Almost 50% of the organizations we surveyed report they have rolled out a corporate OFS solution for some use cases

HOME

FIVE THINGS THAT  
SHOULD HAPPEN  
IN 2014PONDERING CLOUDS,  
HELIUM AND  
BLACKPEARLHOW FLASHY DO  
YOU NEED TO BE?REPORTING APPS  
TAKE THE DOUBT OUT  
OF BACKUPUSERS GIVE THUMBS  
UP TO HITACHI  
AND DELL NASREIN IN SYNC AND  
SHARE, OR ELSEWITH APP-AWARE  
STORAGE, RAW CAPACITY  
IS SECONDARYBACKUP ANGST PERSISTS,  
BUT DEDUPE AND CLOUD  
OFFER SOME RELIEF

(in limited scope, mostly for workgroups for specific projects).

Many corporate OFS vendors are building out capabilities that allow them to participate in regulated workflows. HIPAA, given its broad applicability across organizations, is high on the target list for many vendors, and many others report they can participate in HIPAA-regulated workflows and meet the appropriate requirements. FISMA and PCI DSS are also on their priority lists. After that, coverage gets pretty spotty.

What these OFS offerings *can* do is limit access to data, and limit what users can do with those files (read, write, modify and/or share). Most of them offer reporting and auditing capabilities that provide IT with insight into which employees are accessing what information, and whom they're sharing it with.

Most early adopters of OFS products are using cloud-based offerings, but there's significant interest among these organizations in deploying solutions that would allow them to store some or all their data on premises. Vendors have responded with the [emergence of hybrid or even on-premises solutions](#). Others are addressing the security concerns surrounding public cloud deployments

by allowing subscribers to manage their own encryption keys so that no employee of the service provider can access readable data (nor turn that data over in the event of a subpoena).

The moral of the story is this: IT is no longer in command of data. It's much too easy for an employee to access and use productivity applications they source on some public app store. IT can put policies in place to punish or regulate the behavior (but we've repeatedly seen those policies fail), or it can embrace the behavior and formalize the process to gain control over corporate data. There are OFS offerings available that meet the needs of regulated environments. Still, just adopting a corporate solution and telling employees to use it isn't enough. IT needs to work collaboratively with those departments that have collaborative needs and make them a part of choosing the solution. If you put some onus on the knowledge workers themselves, since they understand their needs best, they're much more likely to adopt a solution that they were a party to choosing. ■

---

TERRI McCLURE is a senior storage analyst at Enterprise Strategy Group, Milford, Mass.



HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

# Do megabytes matter anymore?

*Raw capacity numbers are becoming less useful as dedupe, compression and application awareness provide more value than sheer capacity.*

# W

**HETHER CLAY POTS**, wooden barrels or storage arrays, vendors have always touted how much their wares can reliably store.

And invariably, the bigger the

vessel, the more impressive and costly it is, both to acquire and manage. The preoccupation with size as a measure of success implies that we should judge and compare offerings on sheer volume. But today, the relationship between [physical storage media capacity](#) and the effective value of the data “services” it delivers has become much more virtual and cloudy. No longer does a megabyte of effective storage mean a megabyte of real storage.

Most array vendors now incorporate [capacity-optimizing features](#) such as thin [provisioning](#), [compression](#) and [data deduplication](#). But now it looks like those vendors

might just be selling you megabytes of data that aren’t really there. I agree that it’s the effective storage and resulting cost efficiency that counts, not what goes on under the hood or whether the actual on-media bits are virtual, compacted or shared. The type of engine and the gallons in the tank are interesting, but it’s the speed and distance you can go that matter.

## DUPED BY DEDUPE?

Corporate data that includes such varied things as customer behavior logs, virtual machine images and corporate email that’s been globally deduped and compressed might deflate to a twentieth or less of its former glory. So when a newfangled flash array only has 10 TB of actual solid-state drives, but based on an expected minimum [dedupe ratio](#) is sold as a much larger effective 100+ TB,

HOME

FIVE THINGS THAT  
SHOULD HAPPEN  
IN 2014PONDERING CLOUDS,  
HELIUM AND  
BLACKPEARLHOW FLASHY DO  
YOU NEED TO BE?REPORTING APPS  
TAKE THE DOUBT OUT  
OF BACKUPUSERS GIVE THUMBS  
UP TO HITACHI  
AND DELL NASREIN IN SYNC AND  
SHARE, OR ELSEWITH APP-AWARE  
STORAGE, RAW CAPACITY  
IS SECONDARYBACKUP ANGST PERSISTS,  
BUT DEDUPE AND CLOUD  
OFFER SOME RELIEF

are we still impressed with the bigger number? We know our raw data is inherently “inflated” with too many copies and too little sharing. It should have always been stored “more” optimally.

But can we believe that bigger number? What’s hard to know, although perhaps it’s what we should be focusing on, is the reduction ratio we’ll get with our particular data set, as deflation depends highly on both the dedupe algorithm and the content.

### AN EXABYTE BY ANY OTHER NAME

We all know data is growing, as is the amount of storage we have to deploy and manage. Structured databases are growing to terabytes, less structured bigger data to petabytes, and multi-tenant clouds are [aggregating exabytes](#).

But I feel that in this era of big data, raw capacity just isn’t that much of an interesting number anymore. Of course, there’s going to be more data and, therefore, more data storage. We’re making and keeping data at a pace that’s economically balanced by how much it costs vs. the value of doing it. Storage capacities per dollar are inevitably increasing. As storage capacity gets cheaper and [big data analytics show how to extract business value](#) out of massive amounts of data, we’ll keep even more data around. So storage capacities will keep getting bigger.

### STORING IT ALL, ONCE

High-capacity storage devices like [HGST’s 6 TB helium](#)

[drives](#) are available today, with holographic optical storage coming. Denser flash and more advanced types of non-volatile memory are also on the way. Combined with better dedupe and compression by excess CPU bandwidth in modern arrays, this will lead to some massive leaps in the amount of terabytes under management.

Frontline storage is getting deduped these days, and often compressed. Vendors with existing storage platforms like EMC Isilon are [adding post-processing dedupe](#) that squishes storage offline so it doesn’t put a drag on performance. Some newer architecture vendors, however, are leveraging innovative flash designs to successfully dedupe inline, like SimpliVity with its high-performance ASIC.

One of the great things about [inline dedupe](#) is that it can speed performance while shrinking capacity. By eliminating back-end media I/O for duplicate blocks, downstream client reads can get a faster total response. And if replication is built on top of dedupe, then only new blocks need to be replicated. We expect data will be deduped on the storage side once, and be kept in that format throughout its lifecycle in storage—through archive, metadata-level operations (e.g., VAAI), backup and restores.

### IT’S WHAT YOU DO WITH IT

As the trend toward deflating data in storage continues, we expect external apps to get in on the action. [Oracle’s Hybrid Columnar Compression](#) for its structured

HOME

FIVE THINGS THAT  
SHOULD HAPPEN  
IN 2014PONDERING CLOUDS,  
HELIUM AND  
BLACKPEARLHOW FLASHY DO  
YOU NEED TO BE?REPORTING APPS  
TAKE THE DOUBT OUT  
OF BACKUPUSERS GIVE THUMBS  
UP TO HITACHI  
AND DELL NASREIN IN SYNC AND  
SHARE, OR ELSEWITH APP-AWARE  
STORAGE, RAW CAPACITY  
IS SECONDARYBACKUP ANGST PERSISTS,  
BUT DEDUPE AND CLOUD  
OFFER SOME RELIEF

database data is an example. In Oracle ZFS, for example, database data blocks are compressed incrementally and in such a way that as data becomes more static it becomes faster for the client to query them. The compressed blocks aren't only archived and backed up in compressed form, but read back into database memory in that form when accessed—less I/O overhead and columnar/analytical format acceleration. [RainStor](#) does something similar for big data processing of structured data, with query performance rising as storage space is optimized.

Tarmin GridBank is a scalable storage grid that [globally dedupes files](#) upon ingestion and parses file content for desired metadata that can then be globally filtered and searched. Since the storage system automatically indexes its content for immediate use by storage clients, it's delivering higher-level services that would otherwise have to be built on at greater cost or with less capability.

These kinds of [application-aware storage capabilities](#) are going beyond simply storing more bits; they're delivering tangible value to storage clients. It's becoming clear that if you want to take competitive advantage of greater data volumes, increasing storage capacities is critical; but it's only part of the solution. IT storage organizations will have to evolve from "just" reliably persisting bits on media to offering sophisticated data services at a higher, business-focused level.

## APPLES TO ORANGES

There have always been data protection factors that impact how much physical storage a megabyte of data actually requires. We've long specified classes of storage in our catalogs based on well-known RAID and replication schemes that consume differing amounts of physical storage. But now there are complicating alternatives in the form of [erasure and fountain coding schemes](#), flash-specific data protection approaches, advances in [automated tiered storage](#), and tape solutions that appear more like slow disk than offline media.

Today, the key measure of "raw" capacity as an indicator of big storage is no longer reliable. It's no longer a question of how much you're able to store, but what value you can get out of the data you do keep. It's a difficult transition, but I'd like to see more vendor metrics and licensing schemes that focus on the value of data services provided instead of the size of raw storage. I expect that within just a couple of years, simply measuring storage by the byte will become relatively ineffective, while posting big numbers focused on the business value added by aligned data services will become critically important. ■

---

**MIKE MATCHETT** is a senior analyst and consultant at Taneja Group.

HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

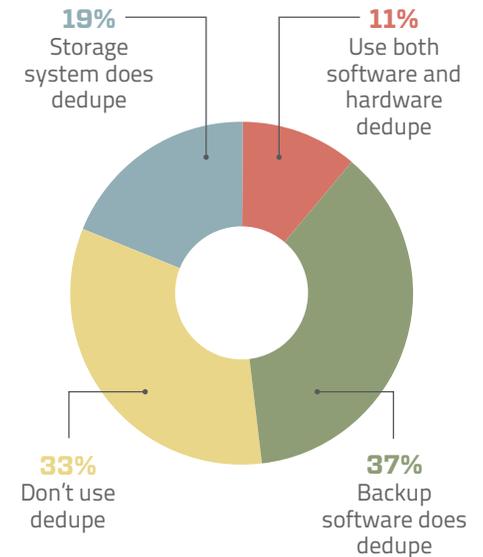
WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

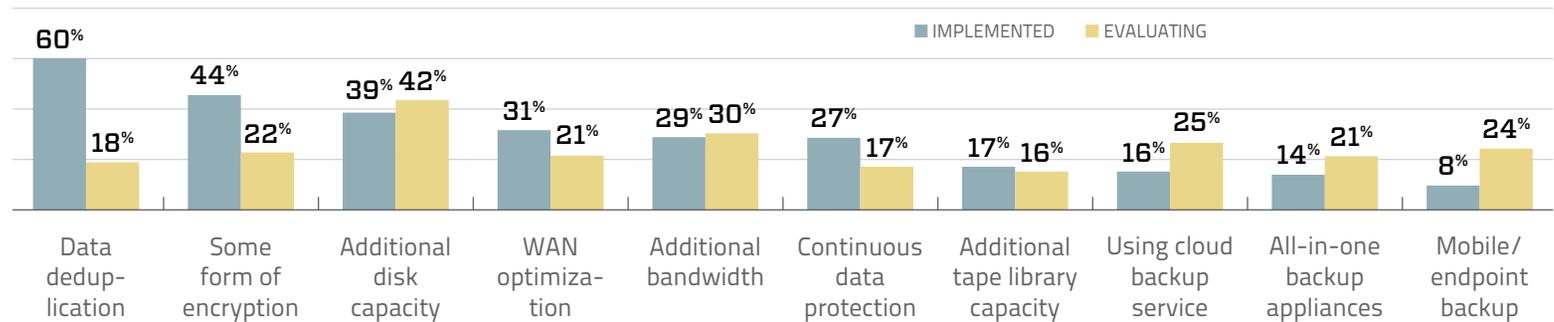
## Backup angst persists, but dedupe and cloud offer some relief

**THERE'S AN OLD** saying that backups are easy, it's the restores that are the problem. But our latest survey reveals that the data backup process is hardly a piece of cake. Forty-nine percent of respondents say their biggest backup bugaboo is the time it takes to complete a backup; for 48% the culprit is [keeping up with growing capacities](#). Some are still [grappling with virtual server backup](#) (28%), while about a quarter are trying to keep up with application requirements. On average, about 63 TB of data is backed up each week, and 47% of those surveyed say a lot of that is redundant; at the other end of that spectrum, 26% fear they're not backing up everything they should be. On a brighter note, only 16% [bemoan failed backups](#); but 31% would like better monitoring and reporting tools to track backups. Two-thirds are [using deduplication](#) to deal with some of these niggling issues, which is a bit higher than we've seen previously. Slightly less than one-fifth [use the cloud to store](#) an average of 37% of their backup data. More [disk for backup](#) is on a lot of respondents' shopping lists (84%), with an eye to adding an average of 28 TB of new capacity. —*Rich Castagna*

DOES YOUR COMPANY'S BACKUP PROCESS INCLUDE DEDUPLICATION OF BACKUP DATA?



WHICH OF THE FOLLOWING BACKUP TECHS DO YOU USE NOW OR WILL EVALUATE?





HOME

FIVE THINGS THAT SHOULD HAPPEN IN 2014

PONDERING CLOUDS, HELIUM AND BLACKPEARL

HOW FLASHY DO YOU NEED TO BE?

REPORTING APPS TAKE THE DOUBT OUT OF BACKUP

USERS GIVE THUMBS UP TO HITACHI AND DELL NAS

REIN IN SYNC AND SHARE, OR ELSE

WITH APP-AWARE STORAGE, RAW CAPACITY IS SECONDARY

BACKUP ANGST PERSISTS, BUT DEDUPE AND CLOUD OFFER SOME RELIEF

## STORAGE MAGAZINE

EDITORIAL DIRECTOR Rich Castagna  
SENIOR MANAGING EDITOR Kim Hefner  
EXECUTIVE EDITOR Ellen O'Brien  
CONTRIBUTING EDITORS James Damoulakis, Steve Duplessie, Jacob Gsoedl

## SEARCHSTORAGE.COM

EXECUTIVE EDITOR Ellen O'Brien  
SENIOR NEWS DIRECTOR Dave Raffo  
SENIOR NEWS WRITER Sonia R. Lelii  
SENIOR WRITER Carol Sliwa  
SENIOR MANAGING EDITOR Kim Hefner  
ASSOCIATE SITE EDITOR Sarah Wilson

## SEARCHCLOUDSTORAGE.COM

**SEARCHVIRTUALSTORAGE.COM**  
EXECUTIVE EDITOR Ellen O'Brien  
SENIOR MANAGING EDITOR Kim Hefner  
ASSOCIATE SITE EDITOR Sarah Wilson

## SEARCHDATABACKUP.COM

## SEARCHDISASTERRECOVERY.COM

## SEARCHSMBSTORAGE.COM

## SEARCHSOLIDSTATESTORAGE.COM

SENIOR SITE EDITOR Andrew Burton  
MANAGING EDITOR Ed Hannan  
FEATURES WRITER Todd Erickson

## STORAGE DECISIONS TechTarget Conferences

EDITORIAL EVENTS MANAGER Jacquelyn Hinds  
EDITORIAL EVENTS MANAGER Maria Gomez

## SUBSCRIPTIONS

[www.SearchStorage.com](http://www.SearchStorage.com)

Storage magazine  
275 Grove Street  
Newton, MA 02466

[editor@storagemagazine.com](mailto:editor@storagemagazine.com)

TechTarget Inc.  
275 Grove Street  
Newton, MA 02466  
[www.techtarget.com](http://www.techtarget.com)

©2014 TechTarget Inc. No part of this publication may be transmitted or reproduced in any form or by any means without written permission from the publisher. TechTarget reprints are available through [The YGS Group](#).

**About TechTarget:** TechTarget publishes media for information technology professionals. More than 100 focused websites enable quick access to a deep store of news, advice and analysis about the technologies, products and processes crucial to your job. Our live and virtual events give you direct access to independent expert commentary and advice. At IT Knowledge Exchange, our social community, you can get advice and share solutions with peers and experts.

COVER IMAGE AND PAGE 9: PETER DAZELEY/GETTY IMAGES