



DECISIONS IN A **FLASH**

Making Flash Storage Decisions that Won't Come Back to Haunt You.

INTRODUCTION:

Flash storage arrays are a game-changer for enterprise information technology and applications and by 2019 IDC expects 60-70% of all primary enterprise storage purchases to be flash. ¹

But with different approaches to architecture, data reduction, software and operating models, sticking to the traditional technology purchasing rules guided by price for capacity may lead to sub-optimal flash decisions. Organizations need to factor what these seemingly fuzzy benefits really provide, as they have measurable and important impact to the organization.

A complete understanding of how actual capacity and ease-of-use in production will affect the true cost of ownership equation will help organizations adjust their purchasing logic to make the flash storage decisions that provide the maximum economic benefits.

PENNY-WISE, POUND FOOLISH:

**DON'T LET PRICE ALONE
DRIVE THE DECISION**

Using price alone to guide the flash purchase decision may leave the biggest savings and company gains unrealized.

Purchase price analysis is typically matched against raw capacity. But this is a misleading metric when a key feature and benefit of flash is data reduction, which will increase the actual capacity of the flash array.

Accounting for expected data reduction to quantify actual or expected capacity is tricky but critical to the price evaluation.

For reference, in 2014, Forrester Consulting calculated the Total Economic Impact to a typical Pure Storage customer, at 102% ROI. In their analysis, they found their example customer would spend a total of \$946,792 in costs associated with the array, but achieve a total of \$1,908,644 in economic benefit. ³

Forrester explains, “Though the price per raw gigabyte (GB) of flash storage is more expensive than hard drive storage, a growing number of use cases have developed where the performance, resiliency, and ROI of flash can outweigh the higher acquisition costs. This is due to data reduction features such as deduplication and compression where the usable per GB cost is the same or less expensive in almost all use cases except for low data reduction applications such as video.” ⁴

A complete understanding and calculation of usable (not raw) capacity must be performed and to make the best purchase decision.

**TOTAL ECONOMIC IMPACT
TO A TYPICAL PURE STORAGE
CUSTOMER**

102% ROI

\$1,908,644
Example Economic benefit

\$946,792
Example Costs

SIMPLIFIED STORAGE CAN TRANSFORM IT FROM A CENTER OF COST TO A CENTER OF INNOVATION.

Storage pros must make the expert decisions to best configure and utilize storage to speed applications and prevent problems. They must also provision specific types of storage for others, like the database teams.

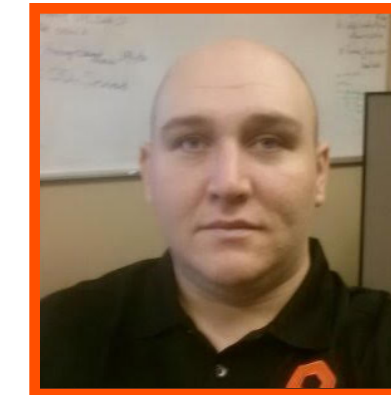
Above all, enterprise datacenter storage is hard, and it's incredibly hands-on.

Storage admins have always had extremely granular control of and access to all the configuration details of traditional storage arrays. This was necessary to troubleshoot the multitude of distinct and complex issues that may affect performance and stability. This complexity is what drives the need for dedicated, experienced storage admins and in turn, their tight control of the storage arrays.

It also makes storage issues a black box to the rest of the organization.

For example, when application owners experience degraded performance and the infrastructure team risks failing to meet SLAs, the problem could be storage, or a poorly crafted application, or a rapidly growing dataset. But the application owner doesn't know or care what causes the problem – she just wants it fixed. When the pressure is on to solve the application slowdown driven by competing causes that no one leader really owns, it can lead to finger pointing among IT co-workers.

“I think a lot of DBAs and Infrastructure teams are trapped in the blame game and always at odds, blaming each other for poor performance in the app,” explained Chris Hinson, a Fortune 1000 DBA in Phoenix.



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And even high-priced, robust flash storage can't be guaranteed to eliminate these historic infrastructure struggles when that flash storage is still hard to use, as Hinson illustrates.

“When storage performance is a nightmare on my buddy's pricey flash array, as a DBA there he must constantly work to produce hard numbers to prove that it's the (storage) disk performance in production that's absolutely terrible (and it wasn't the database). But even when he finally can prove it, storage admins still aren't able or willing to do anything about it. This leads to a fair amount of his DBA time trying to work around bad storage and make up for it with adding memory, compressing DB objects, rewriting queries, indexing (which every DBA does to some extent, but not with the same pressure or level of urgency) and doesn't really solve the issues long term.”

When companies continue the “storage is hard” mindset, as they consider new flash arrays they may dismiss advanced features and functions as just “marketing fluff” to drive higher prices. But, this would be similar to the flawed logic that an iPhone is just a fancy, overpriced cellular phone, when in fact, its simplicity and focus on usability have made it so much more.

Storage admins are now discovering that certain flash storage arrays do eliminate the “storage is hard” problem. These incredibly easy-to-use arrays alleviate huge frustrations and large elements of their routine storage admin workloads.

This creates a huge productivity and performance driver in the datacenter and spurs further gains throughout the other technology teams that rely on storage. In turn, this chain

My current company spends a fair amount on (flash) storage, but we spend less than my buddy's company to store about the same volume of data. Yet - when my laptop can out-perform his company's multimillion-dollar flash array, there's a problem — and it takes its toll on the teams that have to deal with it.

CHRIS HINSON
a Fortune 1000 DBA in Phoenix

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effect alleviates so much productivity-destroying busy work that it can radically transform IT from being a center of cost to a center of innovation.

According to IDC, “customers love the performance and ease of use that AFAs bring to the table (storage performance tuning time immediately drops to zero), and 100% of the customers interviewed by IDC about their AFA experiences expressed an interest in moving more workloads to flash over time.”⁵

Advanced flash arrays not only make storage easier on the storage admin, they make it much easier on the DBAs.

Once teams are liberated from storage hassles, the extra time afforded along with advanced capabilities can foster a new environment of collaboration and agility.

At Hinson’s company, their new flash array made storage concerns disappear for him and his storage admin. There’s no siege mentality here; instead, they meet regularly, and collaborative innovation has taken hold.

“For me, working together across the various teams makes the DBA job a lot more fun. We’ve designed some really cool solutions that wouldn’t have been possible without cooperation from everyone - Database, Storage, Network, OS, and App development.”⁶

And here’s the complimentary perspective from the storage administration side:

“To speak to a DBA with flash arrays you move storage out of the way. Instead of historically having to look at RAID groups and where you are putting the data etc. that becomes irrelevant

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because you are working out of one pool of superfast storage. That level of detail doesn't matter anymore," explained Chris Gurley, 2-time Pure Storage FlashArray buyer (*his detailed story follows*).

"Flash storage provides the ultimate freedom for a DBA to focus on compute and memory and how they are consuming those resources, because the storage won't be a limiting factor," Gurley continued. "Inside the Pure array (*the second of Chris's two purchases*), for example, there aren't a lot of buttons or knobs to mess with. There's not a real job to do. Without special database drive formulas to eke out the performance, I don't really spend any time tweaking the array."

Flash buyers have discovered that when they invest in powerfully smarter features and when simplified operations are engineered into their flash arrays – it means storage actually isn't hard anymore.

It's easier on the storage admin, it's easier on the database admins (DBAs) and application owners – and it's better for the CTO.



Advanced flash storage definitely allows us a nice amount of flexibility while keeping the team lean. Being able to be around the table rather than being in the back office working on setting up LUNs and provisioning storage... the storage admins are now involved in those strategy discussions and really helping that. It's great to have more minds around the table. ⁷

JACK HOGAN
CTO, Lifescript

A FIRST PERSON ACCOUNT: **A BIG LET DOWN LEADS TO BIG SUCCESS**

Flash Storage Buyer Recounts the Cascade of First Round Post-Purchase Problems, but Lessons Learned Drove a Second Round Technical Knock-Out.

Even well-considered flash storage purchases can deliver frustrating results, everything from system stability, operating system upgrades, and actual (versus promised) capacity.

In September 2013, Chris Gurley and his organization started a journey into the assessment and purchase of flash storage, which Chris has [blogged about extensively](#) over the last 3 years. His frustrations and why they occurred – and how they informed a more satisfying choice the second time around – make for informative reading.

Here's the capsule version of his tale of two flash array purchases from two vendors and a comparison of the starkly differing outcomes. An even more detailed account is available on his blog at [TheGurleyman.com](#).



When the second review was over, we learned it was more than just a pricing battle. Don't let the price run away with the discussion.

CHRIS GURLEY
TheGurleyman.com

A FIRST PERSON ACCOUNT: **A BIG LET DOWN LEADS TO BIG SUCCESS**

My company's initial foray into flash storage purchasing took us into two camps and lasted much longer than we expected. In fact, our 2013 storage decision bore with it lessons and tests that lasted until it was once again time to make another upgrade, our 2015 replacement at a sister site.

FIRST PURCHASE AND FAILED PROMISES

In 2013, after our vendor review, we selected EMC XtremIO based on their promises to deliver everything Pure Storage offered and more. The two metrics were data reduction and performance.

Unfortunately, XtremIO didn't deliver on those promises, so EMC made up for it with complimentary hardware at roughly the same scale of their data reduction commitment — 4 to 1.

AVAILABILITY ISSUES

We assumed in the land of enterprise storage that high availability was a given.

But, immediately following our deployment of our new flash storage and for the next few months of early 2014, we learned not to assume anything.

Throughout 2014 we had **numerous issues, bugs and downtime.**

EMC didn't just fail on the promises. Not living up the hype is one thing, but we had actual downtime for everything before their 3.0 release. We technically have never had a non-disruptive update.

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DATA REDUCTION UNDERPERFORMS

As for data reduction, XtremIO started out at 1.5 to 1, in contrast to Pure's 4.2 to 1.

The compression that came in XIOS 3.0 was supposed to bring parity between those numbers, but that never panned out. Instead, the 1.5x deduplication dropped to 1.3x (due to block sizes increasing to 8K), and compression added its own 1.3x, for a net of 1.8x. As I mentioned earlier, EMC addressed this data capacity shortfall with hardware to make raw capacity match/exceed Pure's logical capacity. They stand by their word, and for that, we are thankful.

Strangely enough, it is this capacity factor that caused us to reconsider the competition when it came time to purchase a sister SAN for our XtremIO.

For years before adopting flash storage, we faced the inverse problem of excess capacity that could not support the performance demands. Now we had performance that couldn't stretch to meet capacity (due to the low data-reduction ratio).

SUMMING UP THE FIRST ROUND

Our original vendor (EMC) is good about making sure the solution delivers, even if that means the solution we planned grows by several rack units.

We try not to touch XtremIO. Everything aside from volume provisioning is complicated or delicate, so we try to leave well enough alone. EMC has released 4.0 code but we've been advised to let it ride for a while.

For now it's bought and done and we're in it for the duration of the support contract.

SECOND ROUND: REASSESSING IN 2015

With the quality of the leading enterprise products out there, it's more of a "better and best" decision than a "right and wrong" one.

EMC XtremIO was the incumbent with an exceptional deal on the table to get a matching partner to our existing 2 x 20TB pair of bricks.

Initial estimates, however, put our data needs above what we could bet on that pair to deliver (we learned in Round 1 not to assume more than 1:1 reduction). In an XtremIO world, that means doubling capacity (4 x 20TB), because there are no odd-numbered solutions, except 1-brick.

That doubling extended to rack space, power, and pricing, and this time, EMC failed to compete.

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When the second review was over, we learned it was more than just a pricing battle. Don't let the price run away with the discussion.

It surely matters, but support, management, growth plans, and availability can make operational costs far exceed the upfront ones.

Coming out of the 2013 vendor selection, we didn't have anything bad to say about Pure Storage; we simply believed a competitor's word (at that time) and went forward on faith.

This time around we had the facts and put aside the unproven. This time, the winner earned our business on the following factors:

- // **Innovation:** the highest data reduction
- // **Simplicity:** deployment and management
- // **Cost:** lowest price for logical capacity (see "Innovation")
- // **Support:** great support in 2013 and same today
- // **Environment:** lowest power and least rack space (7U for our setup)
- // **Expansion:** granular, customer-handled, and non-disruptive
- // **Availability:** architecture and track record in our environment

For our internal discussions, we put different filters and weights upon those factors as we measured all of the candidates, and regardless of the weighting, Pure won.

Although the upfront price may seem higher compared to other vendors, Pure is not more expensive in my opinion because of data reduction and reduction in storage admin employee costs.

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Pure Storage accelerates possible, transforming businesses in ways previously unimagined. The company’s disruptive, software-driven storage technology combined with a customer-friendly business model drives business and IT transformation for customers through dramatic increases in performance and efficiency at lower costs. Pure Storage FlashArray//m is simpler, faster and more elegant than any other technology in the datacenter. FlashArray//m is ideal for the move toward big data and for performance-intensive workloads such as cloud computing, database systems, desktop virtualization, real-time analytics and server virtualization. With Pure’s industry leading NPS score of 79, Pure customers are some of the happiest in the world, and include large and mid-size organizations across a range of industries: cloud-based software and service providers, consumer web, education, energy, financial services, governments, healthcare, manufacturing, media, retail and telecommunications. With Pure Storage, companies push the boundaries of what’s possible to become faster, smarter and more innovative.

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