



White Paper

The Economic Value of the NetApp FAS2500 Running Data ONTAP 8.3

By Mark Peters, Senior Analyst; and Monya Keane, Research Analyst

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Contents

Introduction and Market Needs	3
Storage Can Be Both Effective <i>and</i> Efficient.....	4
Value Has Two Key Components ... Plus More	5
The NetApp FAS2500 Flash-accelerated Storage Array	5
Key Functions of the FAS2500—and Their Potential Economic Value	6
Enterprise-class Capabilities for the Entry-level and Midmarket.....	6
Capable and Affordable.....	8
Storage Infrastructure That’s Easy to Use	9
Real-world Validation of Value	10
Examples of FAS2500 Cost Control and Business Benefit	10
Reasonable Expectations.....	11
The Bigger Truth	11

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Introduction and Market Needs

Keeping an IT environment running optimally has always been a multifaceted endeavor. Although product features and functions get a lot of attention, the underlying motivations for all the effort is almost always a focus on risk, TCO, and ROI—each of which ultimately centers on *value*. Without question, there is clear value to be gained from:

- **Reducing risks to a business**, which is well understood—but there’s also the less discussed but well-known value of trying to reduce the risks that come with having an overworked (and probably dissatisfied) IT team.
- **Improving an organization’s total cost of ownership (TCO)** profile by lowering both capital and operational expenditures—everything from the amount of equipment to electric power usage and management time.
- **Increasing an organization’s return on investment (ROI)** by leveraging tools to deliver some new benefit. It can happen either by improving the way some existing thing gets done (perhaps getting delivery trucks out faster), or by enabling something completely new to be done (perhaps cross-system analytics).

IT teams are charged with keeping CapEx and OpEx low, servicing data growth, imbuing the business with added flexibility and responsiveness, dealing with end-users’ ever-changing consumption patterns, and overcoming a multitude of unexpected challenges. To them, a good IT technology can have a truly positive impact on TCO *and* ROI. (And it would explain why cloud and flash are two trends with significant traction right now.)

According to ESG research, surveyed IT professionals confirm that *managing cost and driving ROI are important issues*. Organizations are much less likely to resort to layoffs or canceling projects to manage costs—and much more likely to pursue technologies with a higher return on investment (see Figure 1).¹

Figure 1. Cost-containment Measures

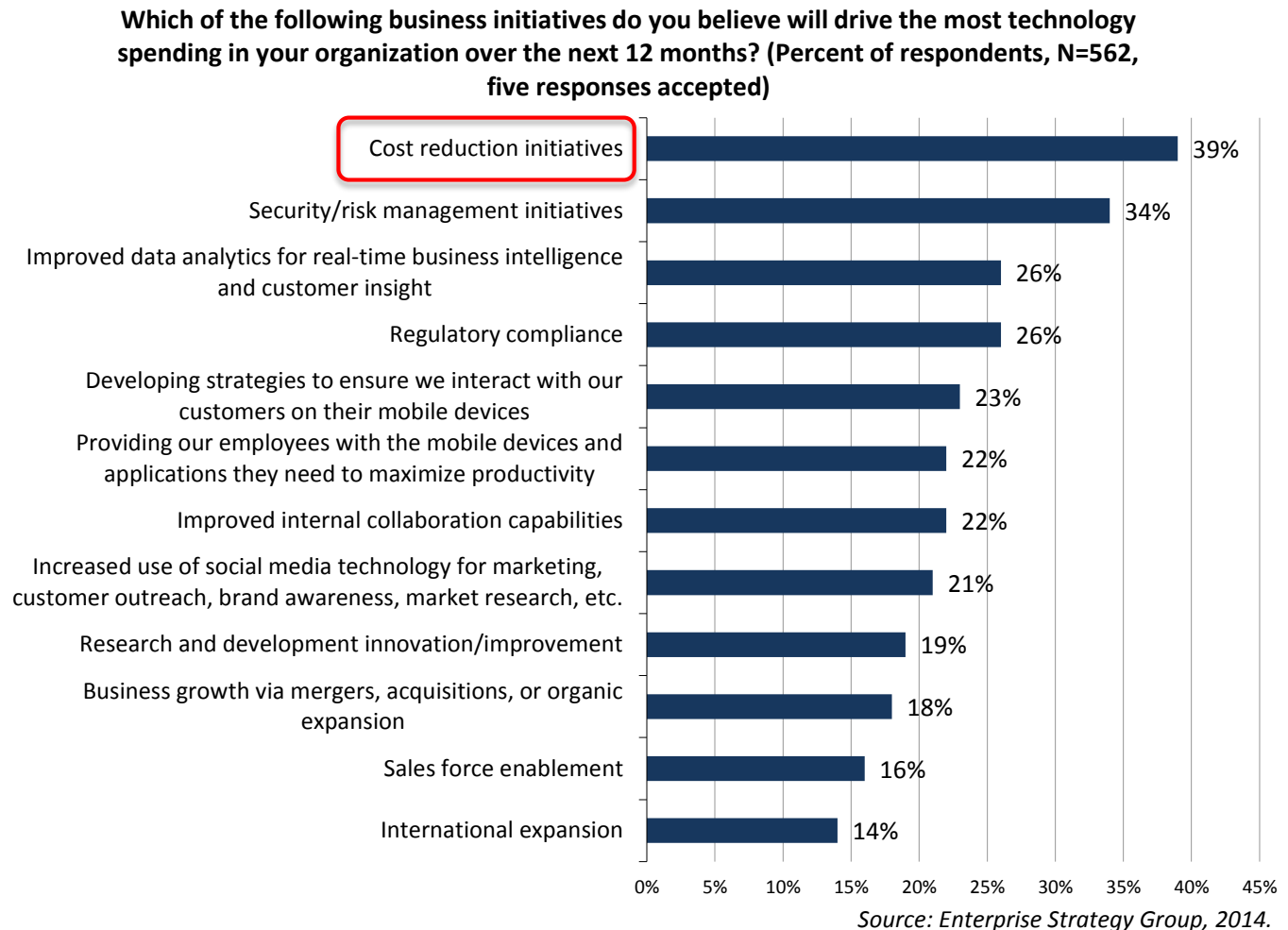


Source: Enterprise Strategy Group, 2014.

¹ Source: ESG Research Report, [2014 IT Spending Intentions Survey](#), February 2014.

Additionally, and not surprisingly in this ultra-competitive world, ESG research also confirmed that straightforward cost-reduction initiatives represent the single most commonly cited driver for IT spending among respondents surveyed (see Figure 2).²

Figure 2. 2014 Business Initiatives with the Greatest Impact on IT Spending Decisions



Storage Can Be Both Effective *and* Efficient

Clearly, IT organizations would prefer it if all their infrastructure elements could not only do their operational jobs well (i.e., be effective), but also deliver significant value to the organization in terms of improving both TCO and ROI (i.e., be efficient).

Although applications and virtualized management platforms might logically be expected to deliver upon this desire, the idea that storage—especially a midmarket-focused storage platform—could be a part of delivering such value is likely foreign to some IT professionals. The storage system in the proverbial corner is all-too-often seen simply as a “boring but important” tool, and that may frequently be the case. But it is possible for good storage systems to provide a surprising amount of value.

This paper focuses on an example of good storage that can indeed provide a good—and sometimes surprising—amount of value: the new [FAS2500 system](#) with Data ONTAP 8.3 software management offered by [NetApp](#) delivers value that meets users’ needs for effectiveness and efficiency, while reflecting the current trends of cloud and flash.

² Ibid.

Value Has Two Key Components ... Plus More

It is worth remembering that “value” has two components: “driving down costs” and “driving up business benefits.” The business benefit side boils down to people being able to do things better than they could before, or perhaps enabling them to begin accomplishing goals that were not previously achievable (for instance, getting every invoice out on time or getting new application releases into production faster).

The NetApp FAS2500 can help organizations overcome significant operational challenges, and that capability also provides *emotional value*: Specifically, it means end-users won’t need to be notified of, say, production delays that are now precluded. Consequently, IT won’t look bad to upper management. Everyone’s peace of mind increases. Emotional elements are not always fashionable to discuss in the pragmatic, measured, fact-driven world of IT, but far more interest exists in this sort of “certainty of calm delivery” than we all might like to pretend! Systems such as the NetApp FAS2500 can help to deliver a happy, productive IT department ... just as much as a satisfied CFO.

The NetApp FAS2500 Flash-accelerated Storage Array

NetApp’s new FAS2500 system running Data ONTAP 8.3 is a fine example of storage that delivers value in many ways. Before getting to the specific details of those value-delivery elements, it is worth recounting the “essence” of the product. Built to benefit from the recently released NetApp Data ONTAP 8.3 operating system, the FAS2500 delivers enterprise-class abilities from an entry-class platform. Features include:

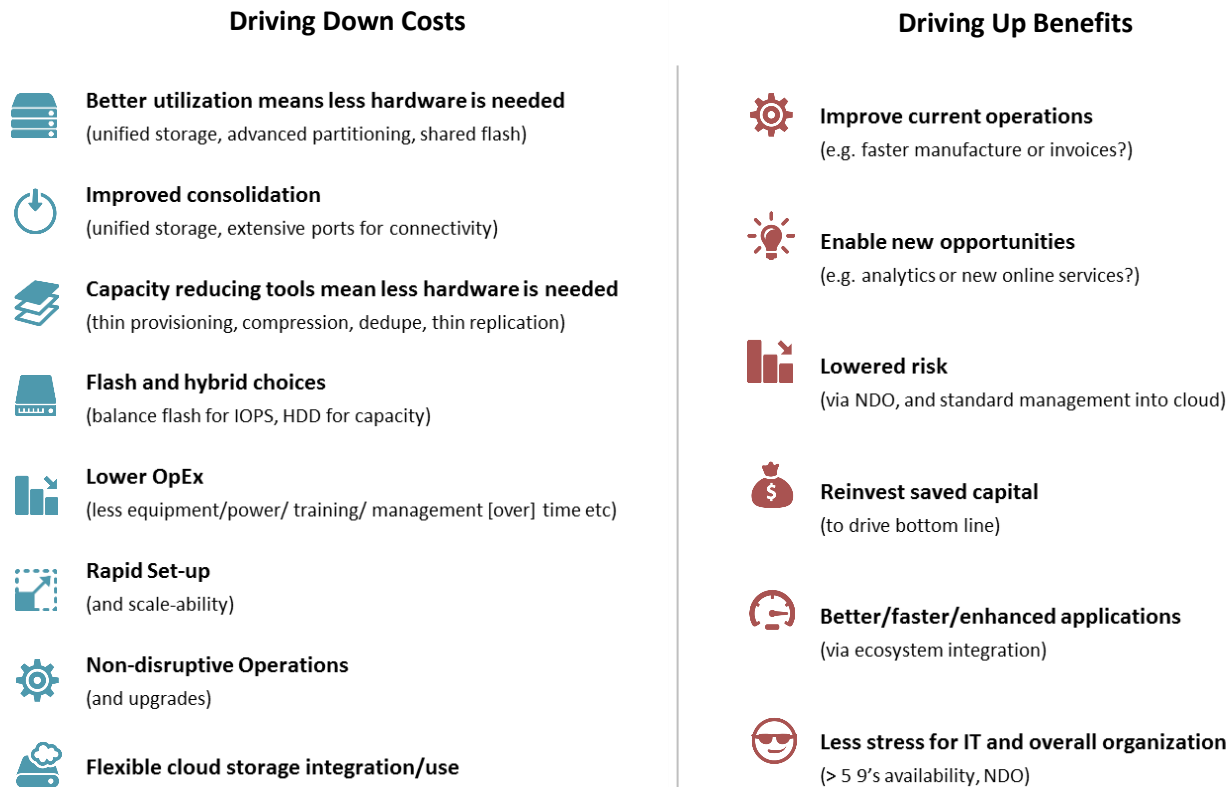
- Consolidation of multiple SAN and NAS workloads in a unified, scale-out architecture.
- Extensive and flexible flash acceleration.
- Non-disruptive operation and sophisticated data management capabilities.
- Setup requiring less than ten minutes from initial power-up to serving data, per NetApp.
- Sophisticated data-portability capabilities that let IT organizations connect to the cloud and move data in and out as needed, yet with a common management framework. (As mentioned, a combination of FAS2500 with Data ONTAP 8.3 can help optimize both aspects—significantly enhancing private or public cloud deployments *and* advancing the use of flash acceleration.)

Many of these attributes existed in previous-generation NetApp arrays, but NetApp has added new capabilities and benefits to round out the value story further. Specifically:

- Improved flash integration (to better leverage flash).
- Enhanced ROI via advanced drive partitioning.
- Better partner integration (to add significant productivity).
- Improved ease of use.
- Additional cloud-ready capabilities.

Figure 3 summarizes graphically how the FAS2500 storage system can help to deliver a range of real-world, positive economic impacts to organizations.

Figure 3. The Potential Positive Economic Impact of FAS2500



Source: Enterprise Strategy Group, 2014.

Key Functions of the FAS2500—and Their Potential Economic Value

There are many areas where FAS2500 can bring economic value. Some are less obvious or less easily measurable than others, and many IT professionals may not even realize that all these aspects can—and do—have a direct impact on controlling costs and/or injecting benefit into the IT and business environment. They can be grouped into three general categories:

- “Enterprise-class capabilities for the entry-level and midmarket.”
- “Capable and affordable.”
- “Storage infrastructure that’s easy to use.”

The key functions described below are not intended to represent an all-inclusive list. These descriptions simply highlight how this system’s obvious abilities (better capacity utilization) and less-obvious abilities (more connectivity) can generate *real and measurable economic value*.³

Enterprise-class Capabilities for the Entry-level and Midmarket

All-flash and Hybrid-flash Systems: With a flash/hybrid system, IT organizations have complete flexibility to decide how much or little flash capacity they install, balancing flash for performance with traditional spinning disk drives to provide economical capacity. Using this approach, IT can drive up application performance and drive down storage costs simultaneously—affecting both TCO and ROI in good ways. NetApp offers an all-flash FAS2500 in addition to a hybrid system; both can be used in the same scale-out configuration to achieve optimal flash use while balancing costs. (This kind of flexibility is simply off-limits to many flash startups).

³ All “ESG numbers” appearing in this section are drawn from ESG’s advanced Economic Value Validation practice/model. That model stems from multiple sources to give a fair market default value for certain common items and expenditures in IT.

Also, flash becomes a “better value-add” when it is shared across systems and platforms. Implemented properly to minimize economic overhead, a flash hybrid configuration allows IT to use less storage and use it better.

The integration aspect is important: Businesses want to deploy flash in a variety of ways, and NetApp gives them choices. If an organization believes it will see value in removing all latency and wants an all-flash configuration, it can have one. If an organization is budget constrained, it can select a lower-cost hybrid configuration in which pools of flash support necessary latency-sensitive workloads.⁴ The dollar value of this flexibility depends on a user’s need for/achievement of better application performance rates—and, of course, on the implications that the improvement brings to the business. The *absolute* economic impact will vary a lot from, say, a web-trading company to a dairy, or an accountancy to a bottling plant, but in all cases, the *relative* economic implications can be substantial—even business critical.

In addition to offering advanced drive partitioning for HDDs (described in the upcoming “Capable and Affordable” section of this paper), NetApp delivers advanced drive partitioning for its Flash Pools.⁵ This feature helps organizations leverage their flash resources for even better ROI because portions of the Flash Pools can be applied to accelerate different workloads. Advanced drive partitioning also applies to all-flash configurations of FAS2500.

Non-disruptive Operation (NDO):⁶ Using a storage system that deploys and runs non-disruptively, an organization saves costs. Namely, it won’t lose money to fix problems, and it will likely see improved ROI because it isn’t losing revenue or customer goodwill during a disruption.⁷

Additionally, although saving money and reducing risk is important, so is worker satisfaction (in the IT group and in general). IT organizations are chronically busy and often short-staffed. If an overworked team can avoid having to do updates and refreshes on Saturdays at midnight and instead do them during a workday, that team gets happier. The accounting department does, too, when it sees overtime payouts decreasing!

ESG quantifies availability/uptime by the *value of end-users’ time*, and those numbers add up fast across even relatively small organizations. If a company reduces unplanned outages in a year from five hours to one, and it has 100 end-users relying on the storage system, and those end-users are paid an average \$50.78 burdened hourly rate (i.e., a \$65,000 average annual salary), then: 4 hours reclaimed x 100 users x 50.78 salary = \$20,312 saved in just one year! And that’s before factoring in improvements from the ROI/external customer impact.

Advanced Virtualized Storage Efficiency Features: NetApp storage systems and solutions are known for being efficient. But at this point in the evolution of IT, some users are actually beginning to take for granted well-established features that exist, in part, from virtualizing storage systems. Deduplication, compression, thin provisioning, and thin snaps can all substantially reduce the amount of physical capacity required to support a given workload: Leverage those tools fully and, in a best-case scenario, an organization could reduce its physical storage capacity requirements by 50 to 70% (or more), representing a potentially huge amount of money saved. These features give an organization leeway to delay purchasing more capacity, which in turn provides concurrent savings in all forms of OpEx, from electricity to staff training.

Flexibility Means Economic Benefit

According to NetApp, with a flash implementation, users can make a cluster with a combination of flash and hybrid systems, and then move workloads to the node that has the performance characteristics needed at that time. *And* they can do it for less cost than if they were to buy from a vendor selling only flash options. It is all under the auspices of Data ONTAP. Users don’t need to learn a new OS, and they gain flexibility to go the cloud route, the cluster route, or the “simply scaling” route. If users want to do more with their storage, they can build a cluster, have different sizes of nodes, and have a flash/hybrid system that facilitates moving workloads to storage with the right cost point.

⁴ NetApp has a flash-sizing tool—its Automated Workload Analyzer—to remove the complexity involved in determining the right amount of investment in hybrid flash capacity for each user’s specific workload(s).

⁵ See ESG Lab Validation ([originally for FAS2200](#), updated for FAS2500). *NetApp Entry-level FAS Platforms with Flash Pool*, June 2014.

⁶ NetApp offers an NDO savings calculator available at www.ndocalc.com.

⁷ While not the same as NDO, NetApp’s current AutoSupport data shows FAS2500 systems achieve real-world availability in excess of “5-9s.”

Capable and Affordable

Scale-related Flexibility: A scale-out architecture and an ability to link storage arrays to the cloud (more on that soon) can extend a system's lifespan and thus minimize risk, downtime, and training expenditures. Specifically, if a storage system lasts longer because it isn't being filled up quickly, or if it can be scaled without requiring wholesale replacement, then the organization won't need to buy more/new/different systems or deal with the related training costs.

If an organization can postpone a \$50,000 investment for one year, ESG assumes they could use that capital to earn a 5% return over that year, which would net a \$2,500 benefit.

Whenever something in an IT infrastructure is altered, downtime risk arises. Hours of planning time must be expended each time as well. Scaling flexibly means an organization minimizes those risks and costs or eliminates them altogether. It might be possible to delay or diminish the capital expenditure, and it may be feasible to lower or avoid the manpower costs by reducing the amount of planning and training time.

Flexible Root and Data Partitions: By dramatically lowering overhead, flexible root and data partitions result in better availability and more capacity utilization for data.

With Data ONTAP 8.2, an organization could have had two or three drives dedicated to root. That situation would equate to having around 12TB of capacity *not* usable for data. With the new Advanced Drive Partitioning capability in Data ONTAP 8.3, the root volume is striped *along with* the data; and in the FAS2500, that root drive is only 250GB in size—not 12TB. Obviously, multi-terabyte capacity reclamation is a big “plus” in terms of economic value. In this example, the CapEx savings alone could range from \$10,000 to \$30,000, depending on the level of storage system the user is accustomed to purchasing.

NetApp's internal testing and modeling indicates there is an up-to 45% advantage in usable capacity when using Data ONTAP 8.3 with advanced drive partitioning compared with a similar configuration using the preceding 7-Mode OS.

Unified Storage: In terms of cost and benefit, what is the value of a unified system? Mainly, a unified system is easier to manage than separate SAN and NAS systems, which adds efficiency and reduces the need for training. It also invariably enables a better level of system utilization and permits simplified backups across workloads.

Then there's consolidation. When one connects and consolidates SAN and NAS storage together, it's possible to share data more easily across applications and platforms (resulting in an efficiency-related benefit). And as mentioned, it can drive up capacity utilization (thus providing a cost-related benefit). In other words, rather than maintaining one SAN system and one NAS system that are both, say, only 45% full (wasting a lot of capacity, a.k.a. money), you could have a unified system that is 75% full. This improvement alone can represent tens of thousands of dollars per year in savings.

What might the real hard numbers be? ESG currently uses default costs of \$800, \$1,430, and \$2,650 per TB for (respectively) low, mid-tier, and high-end *raw* storage capacity. So, the CapEx savings alone for a mid-tier storage system user (for, say, just 25TB) could translate to nearly \$36,000.

Increased Number and Flexibility of UTA2⁸ Ports: Even attributes that don't sound too promising on the surface can generate economic benefits. For example, some organizations find themselves buying extra arrays just to get the ports in the same way that they buy extra capacity just to get more performance.

The increased number of ports on the FAS2500 enables IT to connect more systems and service I/O through each array, and that permits more consolidation (for example, perhaps supporting more VMs with a single storage system). It can conserve the use of physical systems, and it can save on VMware or Hyper-V licensing costs because those charges are frequently based on the number of servers.

⁸ The Unified Target Adapter 2 (UTA2) is NetApp's name for the Converged Network Adapter (CNA) port, which provides flexibility for both Fibre Channel and Ethernet connectivity.

In its models, ESG uses a value of \$2,500 per 10Gb port and \$500 per 1Gb port. In terms of flexibility, the UTA2 ports allow either FC or Ethernet connectivity with the same ports and help with investment protection because they can easily be adjusted or repurposed if needs change.

Storage Infrastructure That's Easy to Use

Cloud-linkage and Flexibility: Cloud linkages—at least those with easy integration and management commonality as the Data ONTAP/FAS combination offers—can save an organization serious money. With FAS2500, organizations (especially smaller ones with entry-level deployments) have flexibility to build a private cloud as their business grows (meaning they avoid the proliferation of systems), and they can take advantage of NetApp's capability to offer multi-cloud/multi-hypervisor/hybrid cloud options, which, in turn, *also* gives them leeway to move to another private cloud provider or even replicate data to a public cloud more easily.

Regardless of which option the organization chooses, it will see the same familiar processes, operational methodology, management tools, and data format. The dollar value is hard to generalize across workloads and vertical industries; however, when one considers the granular flexibility that cloud linkages offer in combination with the staffing and CapEx cost-saving examples provided in this paper, it is very easy to impute a cost-value in the range of tens of thousands of dollars—even before considering the benefit/value to an organization from being able to run a more responsive business.

Rapid Setup: A system that is able to begin serving data roughly ten minutes after power-up is invariably going to save valuable IT man-hours. Admittedly, reclaiming administrative minutes in this fashion may not sound like much ... at first. But when one extrapolates the time savings to the multiple IT personnel that may be involved in storage deployments (late at night and on weekends of course!), and when one considers the multiple deployments that happen over months and years, then "minutes saved" becomes "days regained." Keep in mind that ESG's numbers show an average IT administrator costing a company \$112,000 in salary and benefits yearly. Thus, rapid setup can translate into thousands of OpEx dollars *not* being spent by an organization over time.

Management Ease: The management-ease element touches both sides of the cost/benefit equation. A system using NetApp's Data ONTAP storage operating system likely will require less administrator training because administrators either already know Data ONTAP or will find learning it is easy. Training can be expensive in terms of both money and time invested. Less training equals less cost, and that may be an important consideration for buyers of NetApp's entry- and mid-level systems.

This advantage encompasses not only the ease of *initial* setup, but also the *ongoing* ease with which an IT organization can manage a system over its average three to five years of operation. To this end, NetApp offers its OnCommand data management software (at no additional charge with FAS2500) that enables organizations to automate and analyze their storage configuration to help boost performance, minimize risks, and meet SLAs. It all helps reduce time being "eaten" out of busy workdays ... and time saved is money saved.

Application Integration: According to NetApp, the array's superior integration with the overall IT ecosystem can increase IT administrators' productivity by 2-3x.

Specifically, that improvement is achieved by integrating the platform with several major software vendor partners (including Microsoft, Oracle, and VMware) to make management faster and simpler. Because of the tight integration between NetApp and the application vendors, IT staff are able to leverage efficiency tools (such as NetApp's renowned SnapManager functionality) that increase their productivity and enable them to manage between 2x and 3x more storage per person.

Real-world Validation of Value

Scott Gelb is a Senior Consulting Systems Engineer at one of NetApp's solution-provider partners: Red8.⁹ He has great experience—across a range of users, applications, and vertical markets—in understanding and uncovering the economic value that NetApp solutions such as the FAS2500 series can bring.

Emphasizing the flexibility aspects, Gelb confirmed that the FAS product line is appealing: “If you’ve used one, then you know them all,” he says. “FAS2500 serves all NAS and SAN protocols, and you can move from a FAS2500 to a FAS8000 (or the other way if desired) without downtime. It can replicate between any type of controller, and it can even help our customers connect to the cloud.”

Gelb feels that the FAS2500 has an attractive entry-level price, especially considering that it provides enterprise-level software. It uses the same familiar operating system that runs NetApp's midrange and high-end systems, and with recent CPU and memory additions, it boasts a lot of horsepower.

Examples of FAS2500 Cost Control and Business Benefit

- Users can create **Flash pools** in the FAS2500 by adding SSDs for a performance boost. This action can have a direct cost-control impact. Gelb said, “I encounter customers—including one project I just worked on—who run workloads with high IOPS requirements that require 92 SAS hard disks or so to meet. These customers don't actually need that much capacity; they're using all those HDDs to increase *performance*. A FAS2500 system can give them the same result with 22 SSDs—and it's a lot less expensive to deploy and use 22 SSDs versus either 92 SAS or 190 SATA HDDs!”¹⁰
- There's definitely an advantage to having everything **unified**, Gelb commented, adding, “The new entry-level machine is faster than NetApp's FAS3210 midrange version was just two years ago, making it well-suited to supporting many types of workloads. If an organization can consolidate enough workloads on one FAS2500 rather than buying lots of separate SAN and NAS boxes, that action could save it—let's say—\$20,000 to \$100,000 at purchase time ... and then at least \$10,000 annually after that in reduced maintenance and operational fees. Anyone should be able to appreciate those legacy hardware savings.”
- Gelb also recalls that several years ago, **storage-array setup** tasks could take days to complete. By last year, that time had typically been reduced to a half-day. Now, NetApp's System Setup Tool has hastened the process further through automation. Gelb says, “As long as it is racked and cabled properly, this system can start serving data within minutes, and it's measurably faster than what we see with competitive offerings.”
- Gelb observed that some of the organizations he supports upgrade their systems three to four times a year, usually following patch releases. With “vanilla” storage systems, such efforts typically result in 30- to 60-minute outages, even if nothing goes wrong. Time is money, so clearly, the economic savings from **non-disruptive upgrades** add up over time.
- The **increased number of ports** definitely brings economic value as well, Gelb says. “Natively in the controller, the FAS2500 has additional onboard ports. Those ports allow users to support Fibre Channel, FCoE, iSCSI, and all NAS protocols over 10Gb or 1Gb—supporting an incredible level of consolidation without additional rack-space requirements or hardware costs. You don't have to run a bunch of systems to run

⁹ Scott Gelb was interviewed in October 2014 directly by the authors of this paper, and specifically for this report.

¹⁰ To give ESG a sense of the full range of options that could work for this real-world customer's random workload, Scott Gelb had sized it as all flash (22 SSDs), all SAS (92 drives), SAS + SSD Flash Pool (48 SAS drives with 10 SSDs), all SATA (190 drives), or SATA + Flash Pool (74 SATA drives with 10 SSDs). Of course, there are many other user-specific criteria that contribute to a user's decision, but all these options can be served by FAS2500—this is definitely not a “hammer and nail” situation.

different protocols. Instead, you can run a single, very well-utilized FAS2500 system.”

- In terms of **general storage efficiency**, Gelb finds that almost all of his customers run NetApp’s deduplication facility; some use compression and thin provisioning as well. The FAS2500, with its faster CPUs,¹¹ seems to be encouraging more of these users to adopt compression recently. “If an organization were using a generic storage system with no dedupe, compression, storage-efficient replication, or thin provisioning, they’d probably have to buy twice the capacity. So leveraging these efficiency features in the FAS2500 could save that organization thousands of dollars in hardware acquisition costs,” he said.

Reasonable Expectations

In general, an IT organization can expect significant economic value from using the FAS2500 running Data ONTAP 8.3, both in terms of savings (TCO) and business improvement (ROI). And it is not all just about money, either. Reducing *risk* does need to be assessed as well, even though it’s often hard to pin specific dollar values on the reduction (although your company’s risk-management team might be able to share some impressive statistics). And just for completeness, the “soft” benefits of a more emotionally healthy IT team are not to be ignored. Happy people do more work, and they do it better!

The big question of what economic value *you*—any specific user—will achieve is impossible to evaluate or guarantee in a generic paper like this. However, the main points of this paper have been to:

- Create awareness that storage systems such as the FAS2500 really can have a positive economic impact from both TCO and ROI perspectives.
- Explain that there are multiple—sometimes surprising—facets regarding how that value is delivered.
- Give some guidance about the order of magnitude of the likely value ... or at least shed light on how a user might go about a reasonable calculation.

Both a CIO and a CFO will be pleased to see such calculations. Of course, for a whole host of reasons, any given organization might only desire, or only be able to use—and therefore only benefit from—some portion of the value opportunities listed in this paper. But what is clear is that there are literally tens of thousands of dollars in monetary value that can reasonably be expected to be derived by a user of the FAS2500.

The Bigger Truth

Storage systems are usually seen simply as a necessary expense. And certainly with a system that is as comprehensive as FAS2500, you are getting a lot for your money: Despite being an entry-level system, FAS2500 boasts a range of abilities that were, until recently, the remit of only enterprise systems—a unified, scalable, flash-accelerated system that sports cloud integration, non-disruptive operations, and advanced ease of management within its impressive resume.

All those capabilities can help to constrain the TCO of the system. However, as detailed in this paper, NetApp’s FAS2500 in combination with the Data ONTAP 8.3 management software can be used to not only mitigate and reduce TCO expenses, but also potentially deliver ROI value. And this is not merely a “nicety” or marketing assertion. ESG research has shown that constraining costs and delivering better ROI are top drivers of IT investments and operational needs.

There are many surprising places and ways to find and deliver value with FAS2500 and Data ONTAP 8.3. Once users appreciate all the ways in which a storage system can deliver value as well as bytes, then they should investigate how big that *amount* of value can be in their specific IT environment and organization.

¹¹ Although the FAS2500 actually has the same processors as the FAS2200, extra memory now helps drive more speed.



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20 Asylum Street | Milford, MA 01757 | Tel: 508.482.0188 Fax: 508.482.0218 | www.esg-global.com