SOLUTION SHOWCASE

Formation Data Is Making Fundamental Changes to Enterprise Storage

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Abstract: Some traditional storage vendors seem to be desperately holding onto the string of the software-defined storage "kite," hoping it won't pull them completely off their feet. They might publicly enthuse about SDS, but their small semantic steps aren't comparable to working with a laser focus to advance it into reality.

Formation Data Systems is an example of a vendor that doesn't have to worry about undercutting established margins and revenue or contradicting years of previous assertions and claims made to customers. And when data storage's history is written 100 years from now, what preceded Formation will likely look far more odd and sub-optimal than the emerging era of data-focused thinking that Formation exemplifies.

Overview: IT and Storage Challenges

IT generally—and data storage in particular—continues to undergo major, ecosystem-level changes. As a reinforcement of that fact, 90% of the IT decision makers ESG recently surveyed report that they expect storage to look dramatically different in just five years from now, with software-defined storage (SDS), converged infrastructures, and cloud computing each altering the landscape in significant ways.[1]

SDS, which moves storage functionality to a software layer (perhaps, but not necessarily, integrated with a hypervisor or operating system) can allow for the use of more standardized (or commoditized if you prefer), less expensive hardware. Converged infrastructures and cloud-oriented approaches could have drastic impacts as well, either reducing or altogether eliminating onsite purpose-built arrays.

In other words, we certainly won't see storage's demise, but we will see a shift in its nature. *After decades of prediction, storage as a global, mobile, on-demand utility is finally making an appearance.*

Challenges: Data Growth, Web-scale Delivery, Next-gen Apps, Budget Constraints, and More

Of course, IT pros acknowledge that this shift in storage's nature is reflective of their need to overcome many storage-specific challenges. Cost is clearly a key issue for them, with more than half (53%) of the IT pros surveyed by ESG reporting that hardware and/or operational expenses are problematic, and nearly one in five citing cost as their top challenge.[2] Many respondents also are experiencing challenges tied to rapid data growth and the associated requirement to protect it all.
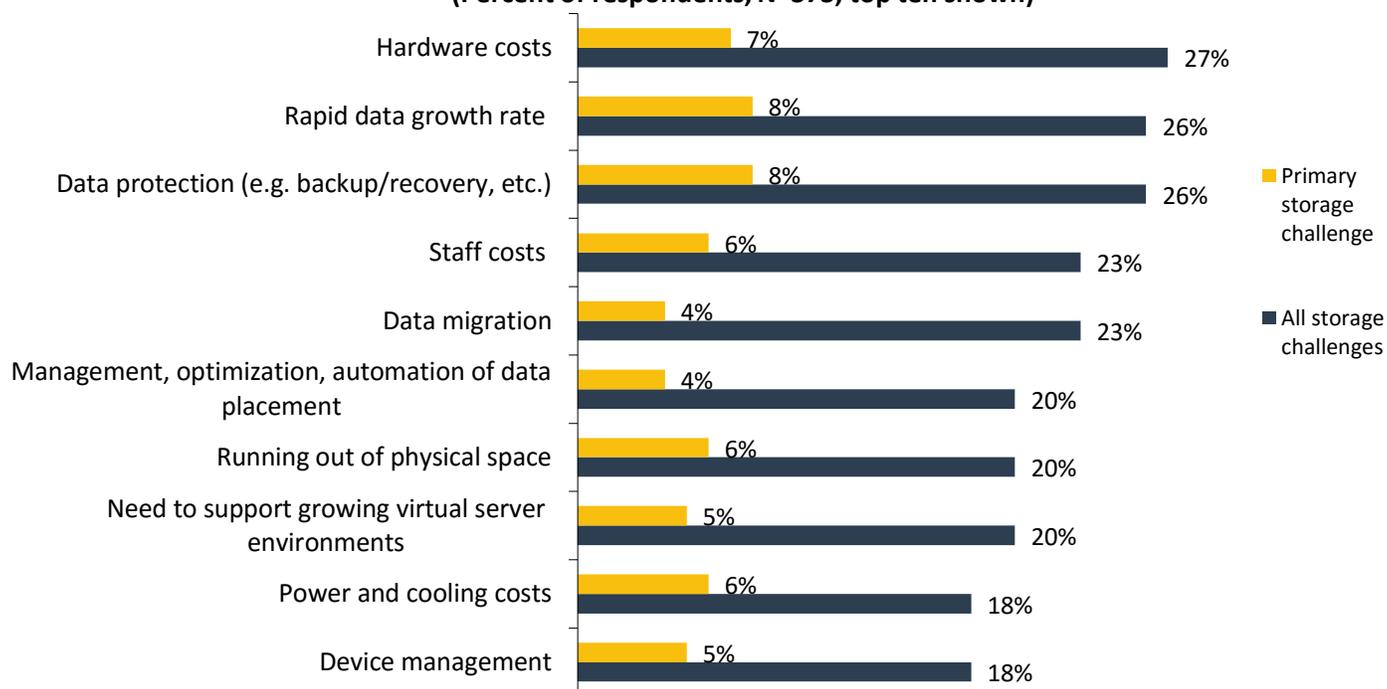
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[1] Source: ESG Research Report, *2015 Data Storage Market Trends*, October 2015.

[2] ibid.

The IT managers were asked to identify their biggest challenges among 21 distinct options that are shaping or influencing their storage decision making today. (Figure 1 depicts just the top ten reported challenges.) Clearly then, the major ecosystem-level changes that nearly everyone seems to believe are "just around the corner" cannot arrive soon enough.

FIGURE 1. Top Ten Challenges with Organizations' Storage Environments

In general, what would you say are your organization's biggest challenges in terms of its storage environment? Which would you characterize as the primary storage challenge for your organization? (Percent of respondents, N=373, top ten shown)

Challenge	Primary storage challenge	All storage challenges
Hardware costs	7%	27%
Rapid data growth rate	8%	26%
Data protection (e.g. backup/recovery, etc.)	8%	26%
Staff costs	6%	23%
Data migration	4%	23%
Management, optimization, automation of data placement	4%	20%
Running out of physical space	6%	20%
Need to support growing virtual server environments	5%	20%
Power and cooling costs	6%	18%
Device management	5%	18%

Source: Enterprise Strategy Group, 2015

A New Approach Is Warranted

Every storage vendor likes to claim its products represent a "paradigm shift," even when the products merely provide an incremental improvement. As a result, the term has devolved into a cliché. Some vendors, however, legitimately can make a paradigm-shift claim. They are the ones directing their energy toward designing storage solutions that are cohesive; non-siloed; and supportive of multiple protocols, approaches, workloads, hardware, and onsite and offsite/cloud topologies.

SDS is a great example of a true paradigm *market* shift, and Formation Data Systems is one vendor that is intent on spearheading that shift. Formation's flagship SDS product, FormationOne, is a software-only subscription model that runs on customer hardware. FormationOne is certainly a manifestation of SDS, but interestingly (and understandably, given the volume of marketing babble around SDS right now), the company does not want to be defined as simply an "SDS vendor." Perhaps that's also because the term is, for now at least, too much of an umbrella descriptor.
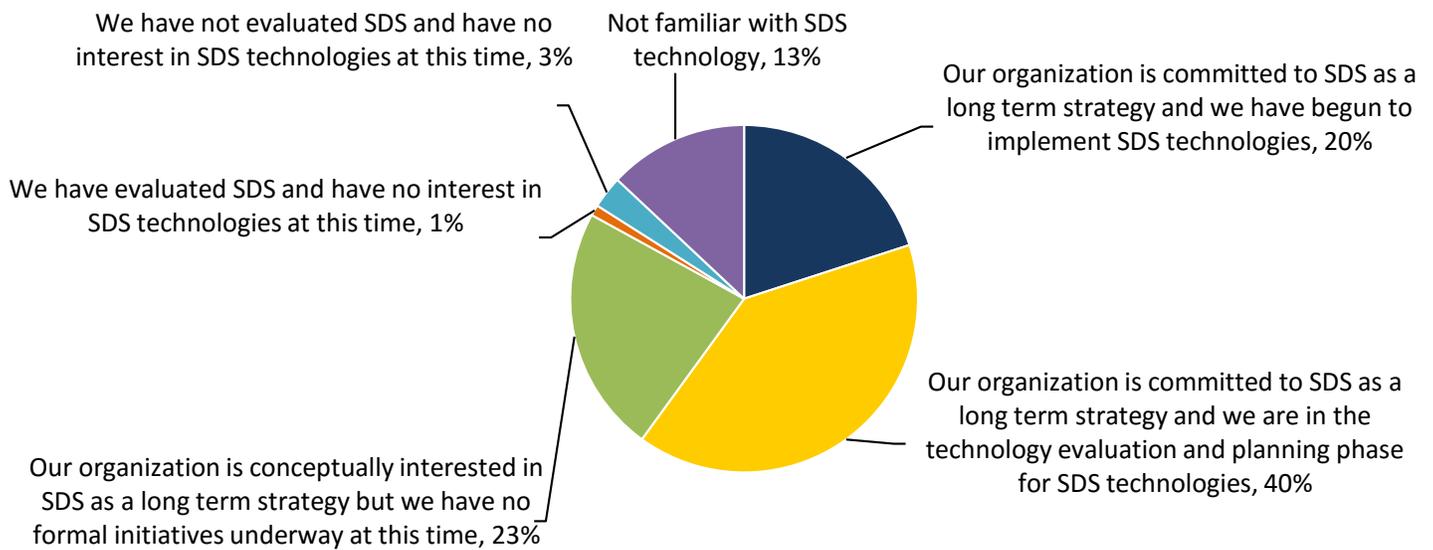
Despite any confusion about SDS's definition (ESG defines it as the abstraction of storage features and functionality from physical arrays to a centralized software layer), IT organizations are definitely intrigued by it. A combined 60% of the IT managers surveyed by ESG indicated they are committed to SDS as a long-term strategy, with one in five already engaging in early-stage SDS implementations (see Figure 2).[3]

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[3] ibid.

Ease of management is a core SDS tenet, and more than half (55%) of surveyed current and potential users identified simplified management as a factor in their decision to consider SDS. There is also clear economic-based interest: Nearly half of current and potential users cited TCO (17%), reduced OpEx (15%), or reduced CapEx (13%) as the most important factors driving them to consider implementing SDS.[4]

FIGURE 2. **Organizations' Perspectives on Software-defined Storage**

Which of the following best represents your organization's perspective on software-defined storage? (Percent of respondents, N=373)

We have not evaluated SDS and have no interest in SDS technologies at this time, 3%

Not familiar with SDS technology, 13%

Our organization is committed to SDS as a long term strategy and we have begun to implement SDS technologies, 20%

We have evaluated SDS and have no interest in SDS technologies at this time, 1%

Our organization is conceptually interested in SDS as a long term strategy but we have no formal initiatives underway at this time, 23%

Our organization is committed to SDS as a long term strategy and we are in the technology evaluation and planning phase for SDS technologies, 40%

Source: Enterprise Strategy Group, 2015

Big companies are looking to SDS as a way to shape the foundation of their future IT environments. For example, Intel is one company that has committed itself: Although Intel's evolution is still in the early stages (and obstacles in scalability and stability need to be overcome), its IT department is already stating publicly[5] that it believes SDS will help to:

- Automate routine tasks such as self-provisioning, modification of existing allocated storage, and deletion.

- Move from a proprietary hardware-software integrated appliance model to a standards-based, decoupled hardware-software model.

Formation Data Systems

When we, as a market, say that a particular vendor is "developing SDS technology," it shows that we still tend to want to fit that vendor into some sort of semantic box. When it comes to SDS, we must get away from too much boxed-in thinking.

Of course, this desire for simple box-descriptors (whether the box is physical or virtual!) is simply a vestige of the fact that for 40 years or more, storage didn't really change at a deep level. Arrays became bigger, faster, and more functional, but they never became truly, legitimately *smart*. A fundamentally different and out-of-the-box thought process regarding storage is necessary to make that happen.

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[4] ibid.
[5] Source: Intel white paper, *How Software-Defined Infrastructure Is Evolving at Intel*, March 2015.

Again, even some new storage-market entrants are still promoting products that alleviate just one part (e.g., just flash, just cloud, or just virtualization) of a bigger storage problem. Making the "least-worst" options of the last few decades less bad is progress of sorts, but such narrow, incremental-improvement products can actually *add* complexity and cost, and even reduce control and flexibility. They definitely don't make storage smart.

A broader re-think was needed, and it is underway, with Formation as a leading "re-thinker." Formation isn't trying to incrementally improve the current ways of doing things. It is—genuinely—offering a new paradigm that represents a difference as vast as the one between selling a softer type of facial tissue and providing the cure for the common cold.

The company, founded in 2012 and recently emerged from stealth, boasts IT luminaries on both its leadership team and advisory board. Of course "luminaries" don't guarantee success…but they pretty much assure you of understanding the failings of prior generation approaches! It is a customer-focused, engineering-centric company with a vision to redefine the enterprise storage market by delivering a software-defined, hyper-scale platform that provides a complete, unified set of storage and data-as-a-service (DaaS) capabilities. The FormationOne product does everything one would expect it to do (delivering such "checkbox" items as HA, snaps, clones, CDP, replication, and so on) and a lot more (see Figure 3), but even more important is *how* it does those things.

FIGURE 3. The FormationOne Architecture
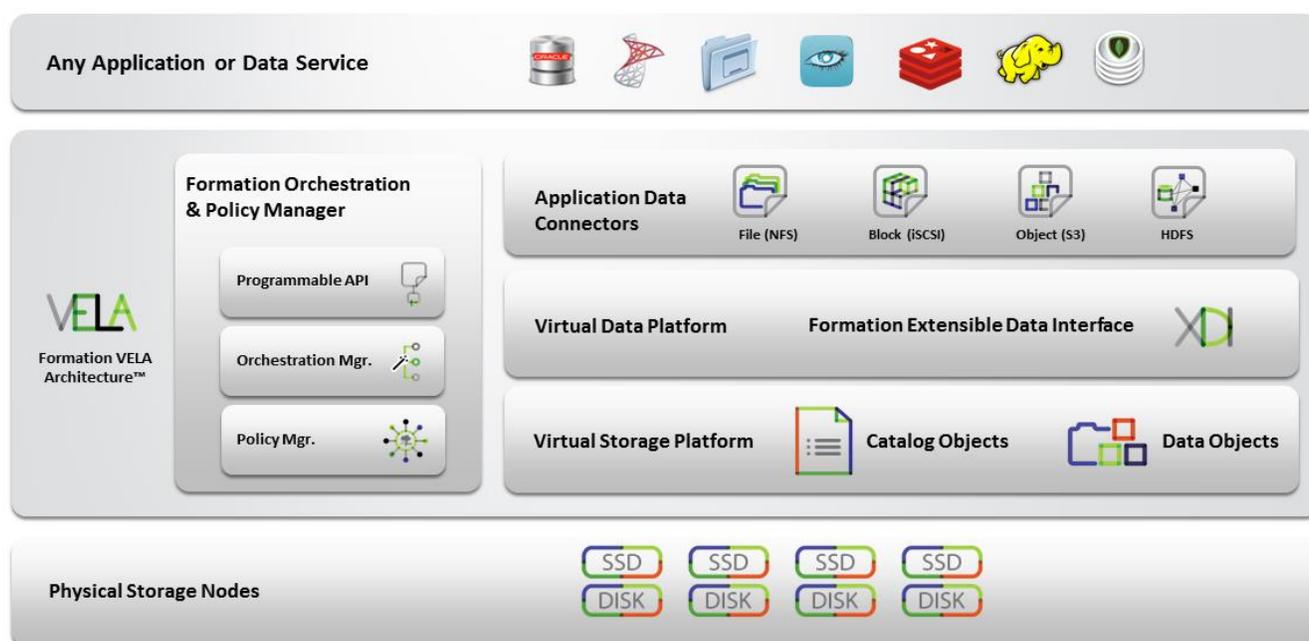
Source: ESG and Formation Data Systems, 2015

At the core of FormationOne is a scale-out architecture called VELA, which is its acronym for "**v**irtual, **e**lastic, **l**oosely coupled, and **a**utonomic":

- **Virtual**—The platform is software-defined and hardware-agnostic. It uses a multi-layer virtualization technology to virtualize infrastructure and data alike.

- **Elastic**—The platform provides an extensible data interface, enabling the addition of any number of access points. It scales from four to more than 1,000 nodes in each domain, and the overall system scales to more than 10,000 nodes.

- **Loosely coupled**—Most of the software elements are highly independent. Configurations and updates do not need to be synchronous across nodes. Thus, VELA can provide robust reliability to applications, even in environments that are reliant on commodity hardware and software.

- **Autonomic**—All foreseeable failure scenarios have already-prescribed actions. Those elements run autonomously, even if the management system is unavailable.

Additional/related attributes and characteristics include:

- Agnosticism across disk, flash, and multi-tenant cloud.

- Cloud-based analytics capable of offering actionable insights and of being exported to external management tools via APIs.

- Ability to perform snaps, clones, deduplication, QoS, and broad data tiering. The software also includes a journaled continuous data protection (CDP) engine to provide transaction-level recovery. A free download for "try-and-buy" and non-production workloads. (Go-to-market focus areas for Formation are test/dev and dev/ops environments.)

The idea is for the software to be a dynamic enterprise storage management solution. Some of its early use cases (the product is in active field use) have centered on traditional iSCSI/NFS, object, cloud, and big data storage.

In summary, FormationOne supports block/file/object data, snaps, thin provisioning, and lots of other functions that one expects from storage today. The paradigm-shift distinction lies in *how* users' and applications' needs are met: It is multi-tenant, user-provisioned and managed. It is responsive and dynamic. It has insights and recommendations built into it. And it meets those needs without being complex, time-consuming, or expensive.

Not a New Ingredient … a New Recipe

Too often, storage has been about finding the "least-worst option." Lately, it's been about finding the "gradually enhanced least-worst option."

Think of IT as a recipe, and storage as one ingredient. Although that ingredient has evolved over decades (and continues so to do), many people have continued to try to cook their same old recipes with it. In truth, people's tastes (represented by today's newer applications) have changed.

Savvy IT professionals should avoid trying to unthinkingly bake the same old IT cake using today's new IT ingredients. Instead, they should consider looking at trying a whole new recipe suited to today's popular tastes. As the demographics of IT organizations and professionals skew younger, so

A User's Perspective

A senior IT engineer at a multi-billion-dollar tech-sector company spoke to ESG about his company's experience with FormationOne—a product he and his colleagues were attracted to largely because of the track records of Formation's leaders and the vendor's extreme focus on data integrity.

Storage "is such a tough thing to do well," he says, asserting that traditional vendors should embrace the SDS enthusiasm of newer market entrants and acknowledge the long-term opportunity it represents, rather than the short-term challenge:

- "With SDS, we want to derive two benefits: One, gain agility. Two, break away from our lock-in dependence on specific physical hardware."

- "Our three key performance indicators are cost, utilization, and SLAs. We see SDS ultimately delivering against all three. Most traditional storage tools—"boxes"—hit only one or two."

- "Traditional proprietary-storage vendors struggle even to *compete* on TCO. They make the frankly highly unlikely assumption that their features and capabilities are equal to those of a good SDS tool."

Interview conducted by the author in November 2015 exclusively for this paper, with anonymity guaranteed for reasons of commercial sensitivity.

much of this will happen by default, but the contemporary advances of tools like FormationOne are available to everyone today.

Those tastes lean toward modern applications built on platforms such as MongoDB, Apache Cassandra, OpenStack, etc., which are supported in conjunction with traditional client/server applications. All of these approaches will benefit from high availability, scalability, extensive automation and flexibility as standard. It is simply a good idea to put everything together in a better fashion now.

The Bigger Truth

It's time to leave closely held beliefs at the door—moving past a *box focus* and toward a *data focus*. Just because "that's how it's always been" doesn't mean "that's how it always has to be." Software is the route to value, and the sea-change in its favor can be emancipatory if used well.

Admittedly, a potential objection some users might have to this kind of "uber-SDS approach" is that they are putting all their old eggs in one new basket and essentially establishing a new kind of lock-in for themselves. But, as is the case now with hypervisors, where many users are beginning to deploy both VMware and Microsoft Hyper-V (partly to run different applications but also to retain choice, dual expertise/insight, and commercial leverage), so too can they have more than one SDS platform if they prefer.

Even today, storage discussions all too often end up being about arcane, granular competitive distinctions that don't really have a lot of impact in the real world. It's all just a reaction to the incremental improvements many vendors are making—which are in sharp contrast to the dramatic changes that vendors like Formation can potentially bring. Those other storage vendors, old and new, would be wise to heed the words of former U.K. Prime Minister David Lloyd George. "Don't be afraid to take a big step if one is indicated," he said. "You can't cross a chasm in two small jumps."

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