

FIVE WAYS TO TAME THE STORAGE BEAST

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As one ponders today's burgeoning storage market, it becomes apparent that storage has become the next great frontier in the data center. As the enterprise faces the reality that yesterday's storage is simply no longer able to keep up with emerging needs, storage vendors have been forced out of their comfort zones and the entire storage industry is being pushed in new directions in order to solve the numerous challenges inherent in legacy storage products.

At the same time, the market is beginning to adapt to another trend that promises to help move IT into a brand new age, one defined by IT's ability to focus on business needs rather than on its ability to solve technical challenges. This age – the Age of Software – is being propelled by companies like Intel, who continues to create ever more powerful processors that have the ability to help customers replace in software what was once relegated to specialized hardware in the form of custom application-specific integrated circuits (ASICs) and field-programmable gate arrays (FPGAs), and storage companies that deliver the entire storage stack in software, and leverage a distributed, scale out storage model that enables a converged compute / storage paradigm, leveraging server –side flash and disk drives.

These two trends have converged into a niche of the storage market that has become known as Software-Defined Storage (SDS). While this space is currently a niche, it's one that is expanding exponentially and that is tied to wider software initiatives that are poised to completely reinvent IT infrastructure as we know it.

In this paper, you will discover five characteristics that define SDS's worldview of how storage *should* work.

LEVERAGING FLASH

Fact: If you're not already leveraging flash in some way, one of the following is probably true:

- Size matters... for now. You're really tiny and simply don't need it... but I'd be willing to bet that this changes in the very near future. More and more workloads are growing to point at which it begins to make sense to consider the use of flash-based storage at some location in the storage stack.
- Solid state is unreliable. Perhaps you still believe that solid state storage is unreliable. Years and years ago, it was true that solid state storage suffered from lifespan issues related to the fixed number of erase/write cycles to which the medium could be subjected. After a certain number of cycles, individual cells in the storage medium would simply die and no longer operate. This led to widespread concern that solid state storage was simply not up to demanding enterprise standards.
- Solid state is too expensive. It's critically important to understand that there are two metrics at play when you consider the cost of storage. The first metric – the number of dollars per gigabyte that storage costs – absolutely tilts in favor of traditional storage over solid state storage, but the \$/GB of solid state storage is plummeting year over year. However, the second metric – the number of dollars per IOPS (Input/Output Operations Per Second) – has emerged as a metric that rivals \$/GB in importance, particularly for I/O intensive workloads. Before the commoditization of solid state storage adding more performance capacity to storage systems meant adding additional hard drives, even when capacity wasn't a problem. It also meant taking extraordinary steps, including using techniques such as "short stroking", which resulted in being able to use only a fraction of the capacity of the hard drive.

Today, with pricing that is constantly dropping and with vendors creating innovative ways to combine both solid state and traditional hard drives in ways that suit both their strengths, solid state storage has become an incredibly common player in the storage chess game. These new breed of companies leverage flash storage in two ways:

- As a storage tier. Some workloads – virtual desktop boot disks, big data tasks – were simply meant to run in flash. With this new approach, administrators can pin these workloads to flash volumes so that they always have the storage performance resources that they crave.
- As an accelerator. With acceleration technology, there is the ability to support legacy hard drives in ways that those devices are meant to operate. By caching reads and writes significantly improving performance. In short, this caching system supercharges your hard disks so you get the most IOPS bang for your buck.

COST

When you really think about it, it's kind of sad that traditional storage is among the most disliked resources in the data center when it often carries the highest price tag of those resources. There are a lot of reasons for the high cost of traditional storage:

- High margins. Let's face it. Traditional storage companies have been far from poor and have enjoyed high margin, with both EMC and NetApp regularly seeing gross margins exceeding 60%.
- Custom hardware. Traditional storage's "secret sauce" often lies in the FPGAs and ASICs that are created by storage companies in order to handle the particularly compute intensive functions expected of these systems, such as RAID parity calculations and deduplication. There is a lot of hardware engineering work that goes into these solutions.
- Optional add-ons. Traditional storage procurement is often viewed as a nickel and dime activity where customers are presented with a huge menu of expansion options for which there is a significant additional price tag. For example, with many legacy systems, deduplication was not a standard feature, but was available as an expensive add-on to base system purchases.

The new approach is that storage should be affordable and that customers should see the maximum value for their storage investment... without breaking the bank. To take it a step further, the software-based solution should include all of the enterprise-class features and functionality. This helps customers significantly simplify the storage equation in the data center at costs that are a fraction of what would have otherwise been spent on legacy storage. And things like deduplication, replication, thin provisioning, snapshots, and much, much more are bundled in.

USER INTERFACE

Traditional storage systems have also created the need to spend money on personnel that can navigate the complex storage landscape and create the constructs – RAID groups, LUNs and volumes – that are necessary in order for applications to be able to consume that storage. In short, storage has been so hard to use that organizations have had to hire storage Ph. D.'s just to make everything work.

In part, this has led to the creating of resource walls inside IT – networking, storage, and systems. Coordination and communication between these silos is often weak, leading to long lead times on new projects, which further increases costs. This is waste... pure and simple. Today, as CIOs and business unit leaders are demanding leaner, meaner IT with a bottom line mission, these old silos must give way to a new order. This new order must embrace, at its core, simplicity in all things. That's where the new hyper-converged software-defined solutions excel. Traditional storage suffers from the fact that management tools focus on the storage. The key to simplification is a VM-centric approach to the storage paradigm and simply hides the complexity and handles it behind the scenes. This allows administrators to focus on what's really important using a single, intuitive tool to get it all done. The result is dramatically simplified IT without the need to have storage experts on hand for every new task.

PURE SOFTWARE

We have entered the age of commoditization. What is that age, you may ask? In days gone by, we purchased specialized hardware to do all of our heavy lifting for us, including in our storage systems. As mentioned previously, custom FPGAs and ASICs were called upon to handle the big time number crunching that takes place in storage systems.

But, a funny thing happened on the way to the ASIC store. Intel snuck up from behind and started selling processors with cycles to spare. As customers began to deploy Intel's newer multicore processors, it became clear that, with systems capable of sporting 6, 8, 10, and even 40 cores of processor power, it was unlikely that virtual environments would become CPU bound anytime soon. In fact, it's far more common for virtual environments to run out of RAM, disk IOPS, or disk space long before CPU even becomes a concern.

With all of this excess CPU capacity, why would storage vendors continue to leverage existing custom hardware designs that are expensive and inflexible?

The ideal storage system is one based purely on software enabling customers to bring their own commodity hardware to bear for storage. With a software only hyper-converged solution, customers can build whatever kind of storage system that is required to meet their individual business needs. Better yet, it effectively eliminates the need for SAN and NAS devices, allowing customers to move back to the simpler days of directly attached storage (DAS). But, don't let that fool you; the solution delivers a distributed file system and a global file system that stitches together all of this node-based storage and presents it to the virtual environment as an aggregated whole. Again, this complexity is completely shielded from the user; with all of the heavy lifting done behind the scenes.

When a storage platform is built in software, every time a new version is released, you get all of the new features in that software, too. The software-based nature of the solution enables ongoing flexibility for customers that won't need to worry about performing the dreaded "forklift upgrade" just to get a new feature in storage.

COEXIST

It's pretty unlikely that a lot of storage administrators will simply walk into their data centers tomorrow morning and start throwing their SANs into the dumpster. It's more than likely that data center administrators would prefer to carefully introduce new technologies and services in ways that correspond to the organization's IT replacement cycles. From a cost standpoint, this is always preferred as it means that there is no need to procure funding outside normal cycles.

The new philosophy embraces the fact that customers can't just throw away everything they have just to accommodate the next new thing. The solution leverages existing servers in a virtualization cluster and customers continue to use their legacy storage array solution alongside the new solution.

Organizations need to look at leaders in this new category of software, such as Maxta who has clearly embraced all these principles. Their platform delivers significant improvements in cost, simplicity and flexibility without compromising any enterprise-class storage data services for end customers.

SUMMARY

Simply put, the new breed of hyper converged, software-defined storage platforms are enabling software-based infrastructure as a service with high end functionality leveraging commodity hardware and embracing simplicity, delivering the maximum business value for customers.