Software-defined storage gains new enterprise converts thanks to Cloudification

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How the Cloud changes storage.

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Clouds Ahead

Everyone knows cloud is growing. According to analysts, cloud and service providers consumed between 35-40% of servers in 2016 while enterprise data centers consumed 60-65%. By 2018, cloud will deploy more servers each year than enterprise.

This trend has challenged traditional storage vendors because more storage has also moved to the cloud each year, following the servers and applications. But it's also challenging storage customers—the IT departments who buy and manage storage—as well, because they are expected to offer the same benefits as cloud storage at the same price.

IT Tries to Beat the Cloud

The appeal of cloud storage is four-fold:

1)   Price: Cloud storage might be cheaper than on-premises storage, as public cloud providers leverage economies of scale and frequently lower prices.

2)   Rapid deployment: Application users can rent cloud storage capacity in a few hours, using a credit card, whereas traditional enterprise storage often requires weeks to acquire, provision and deploy.

3)   Flexibility and automation: Cloud allows rapid increases or decreases in the amount and performance of storage, with no concerns about hardware management or refreshes, while changes and monitoring can be automated with scripts or management tools.

4)   Cost structure: Cloud storage is billed as a monthly operating expense (OpEx) instead of an upfront capital expense (CapEx) that turns into a depreciating asset. You only pay for what you use and it's typically easy to charge storage costs to the application or department using it.

Despite this appeal, many enterprise users are against moving all their storage to the public cloud for various reasons. Security: they might not trust their data will be sufficiently private or secure in the cloud. Regulations: government regulations might prevent them from using shared cloud infrastructure. Or from a performance standpoint, they might have locally-run applications that cannot get sufficient performance from remote cloud storage. (This can be resolved by moving applications to run in the same cloud as the storage.)

Other times, hardware is already purchased and the IT team strives to prove they can deliver on-premises storage

solutions at a lower price than the public cloud. Either way, in the face of public cloud storage that is easy to consume and always falling in price, enterprise IT departments need to make storage cheaper and more flexible, either with a private cloud deployment or more efficient enterprise storage.

Software-Defined Storage to the Rescue

One way to "cloudify" the enterprise is software-defined storage (SDS). This separates the storage hardware from the software, and in some cases separates the storage control plane from the data plane. The immediate benefit is the ability to use commodity servers and drives to reduce storage hardware costs by 50%. Other benefits include increased agility and more deployment flexibility. You can choose different types and amounts of CPU, RAM, drives (spinning and/or solid-state), and networking for different projects and refresh or upgrade the hardware when you want instead of the storage vendor's schedule. If you buy some of the fastest servers and SSDs, they can be your fast block/database storage today with one SDS solution then converted to archive/object storage three years from now using a different SDS solution.

Some SDS solutions let you choose between scale-up vs. scale-out and even hyper-converged deployments, and you can deploy different SDS products for different workloads. For example it's easy to deploy one SDS product for fast block storage, a second one for cheap object storage, and a 3rd one for hyper-converged infrastructure. Compared to traditional arrays, SDS products are more likely to be scale-out and based on Ethernet (rather than on Fibre Channel or InfiniBand), but there are SDS products that support nearly every kind of storage architecture, access protocol, and connectivity option.

Other SDS vendors include more automation, orchestration, monitoring and charge-back/show-back (granular billing) features. These make on-premises storage seem more like public cloud storage, though it's important to note that many enterprise storage arrays have also been adding these types of management features to make their products more cloud-like.

The Challenge of Implementing SDS

The benefits of SDS are appealing but not "free" because it requires integration and testing work. Achieving the 5 or 6-nines (99.999 % or 99.9999% availability) desired for enterprise storage typically requires careful qualification and testing of many aspects including server BIOS, drive firmware, RAID controllers, network cards, and of course the storage software. Enterprise storage vendors do all this in advance with rigorous qualification cycles and develop detailed plans for each model that covers support, upgrades, parts replacement, etc.

This integration work makes the storage more reliable and easier to support and service, but it takes a significant effort for an enterprise to do all this. It could easily require a few months of testing for the first rollout, followed by more months of testing every time the server model, software, drive model, or network speed changes. Cloud providers—and very large enterprises—can easily invest in hardware and software integration work then amortize the cost of their thousands of servers and customers. The larger ones customize the hardware and software while the huge Hyperscalers typically design their own hardware, software, and management tools from scratch. Enterprises need to determine if the savings of SDS are worth the cost of integrating it themselves.

Server Vendors and Systems Integrators Ease the Move to SDS

Customers who want the cost savings and flexibility of SDS without the testing and integration requirements often turn to SDS appliances or bundles created by server vendors and system integrators who do all the testing and certification work. These appliances may cost more to buy and be less open to hardware choices than a "raw" SDS solution that is 100% integrated by the end user. But they still cost less and offer more frequent hardware refreshes than a traditional enterprise storage array. For these reasons the SDS appliances offers a good solution to customers who want the benefits of SDS but don't want to do their own testing and integration work.

The Tradeoff Between Time and Money

In the end choosing between SDS and traditional enterprise arrays usually comes down to a tradeoff between time and money. SDS lets you save money on hardware by investing a lot of time up-front for qualification and testing, while traditional arrays cost more to buy but don't require the upfront time investment. Generally speaking, larger customers find SDS more appealing than smaller customers, but choosing a pre-integrated SDS appliance—which can include hyper-converged or hypervisor-based solutions—can make SDS accessible and affordable to customers of any size.

> *For more perspective on how the cloud changes storage, see the following SNIA resources on Hyperscaler Storage at www.snia.org/hyperscaler*