Enterprise Strategy Group by TechTarget

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The HPE Alletra Storage Server: Innovation That Empowers Software-defined Storage

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Abstract: The pressure is on IT organizations to keep pace with an ever-increasing volume of data—hence the need to establish a more modern data infrastructure capable of supporting a wide breadth of workloads. It is imperative to make sure the storage hardware is optimized to complement today's modern storage software functionality. Fortunately, the HPE Alletra portfolio offers edge-to-cloud infrastructure optimized for software-defined storage (SDS).

Introduction

Data growth is an ever-present concern, and one that becomes even more complex given the following:

- The increasing emergence and adoption of data-centric workloads, such as those related to AI, which are increasing the capacity and performance demands placed on data storage environments.
- The popularity of application modernization initiatives that require high levels of performance-related scalability, often coupled with a need for sophisticated programmatic controls.

As organizations modernize their storage infrastructures to keep pace with business demands (including embracing software-defined storage (SDS), they should avoid defaulting to using commodity arrays and pay attention to optimizing the hardware. This is because commodity hardware limits the potential of SDS solutions and can introduce operational complexities, risks, and costs.

Instead of using commodity storage, they should look to purpose-built solutions such as the HPE Alletra product line of storage servers. HPE designed this product line specifically to serve the needs of modern infrastructures by leveraging focused innovation to enhance the capabilities and benefits of SDS.

Commodity Hardware Comes with Hidden Costs

Research by TechTarget's Enterprise Strategy Group highlights the challenges of data growth, the importance of SDS in supporting that growth, and the hidden costs and risks associated with opting for commodity hardware.

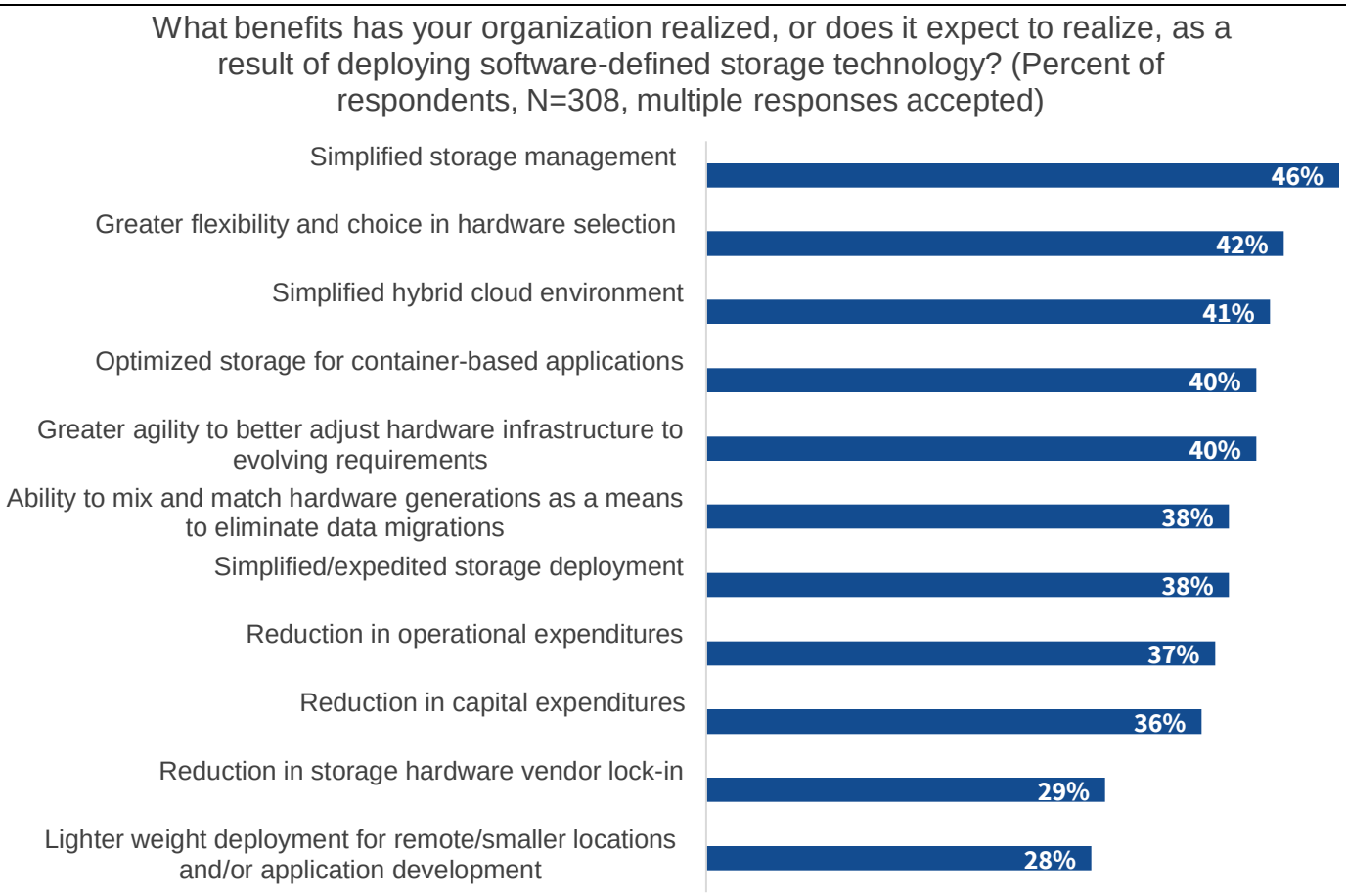
Enterprise Strategy Group has found that 48% of surveyed IT decision-makers report that their organizations are managing a petabyte or more of active data storage capacity across their environments. In fact, it is an average (mean) of 6.7 PB.[1] At the typical organization, 44% of that capacity is on premises, which equates to nearly 3 PB of data center storage capacity on average. On top of that, these organizations are facing 35% annual growth rates, on average, for their on-premises capacity. Within large data environments, especially in industries such as media and entertainment, life sciences, healthcare, and energy, data capacities often grow even larger and faster.

[1] Source: Enterprise Strategy Group Complete Survey Results, *2021 Data Infrastructure Trends*, September 2021. All findings mentioned in this paper are from this study, unless otherwise noted.

Not only is the impact of data growth on internal IT personnel considerable (because more data makes the infrastructure more complex for them to manage), but the sheer cost of the hardware is also one of their biggest storage-related challenges (cited by 26% of surveyed organizations for block storage and by 22% for file storage). Cost control remains a major challenge for any IT organization trying to keep pace at scale.

As a result, many organizations have increased their investments in SDS technology as a means to simplify the data storage environment while controlling for costs. Overall, 63% of IT organizations leverage SDS technology in their on-premises data center environments, hoping to gain benefits such as those shown in Figure 1. Additionally, 30% of surveyed IT decision-makers report that their software-defined data center strategy is a key area of investment related to their data center modernization initiatives.[2]

Figure 1. Most Common Reported Benefits of Using Software-defined Storage



Source: Enterprise Strategy Group, a division of TechTarget, Inc.

[2] Source: Enterprise Strategy Group Complete Survey Results: *2023 Technology Spending Intentions Survey*, November 2022.

Despite the benefits of SDS, all hardware is not created equal. Beyond the challenge of cost, when the storage is not optimized to support data growth, it may not be able to provide the necessary levels of performance, availability, and resiliency to the infrastructure as a whole.

Enterprise Strategy Group has found that 63% of IT organizations agree that it is often challenging for them to properly size workloads for the optimal infrastructure environment, and 64% agree that data storage infrastructure requirements and related spending are hard to predict for their organizations.

When storage is not optimized to support data growth, it may not be able to provide the necessary levels of performance, availability, and resiliency to the infrastructure as a whole.

Those problems are exacerbated when the organization is using general-purpose, commodity hardware that is not designed to support the specific demands of a modern storage infrastructure. The needs of SDS are different than the needs of general-purpose applications. Ignoring the differences will add costs and risks and, in general, will minimize the potential benefits that come with using SDS in the first place.

HPE Alletra Storage Server Innovation

Unlike general-purpose servers, Alletra Storage Servers have been specifically designed by HPE to address the specific demands of today's storage workloads to deliver maximum levels of performance, capacity, and resiliency while controlling for costs. The HPE Alletra Storage Server portfolio consists of the following:

- **The 1 Rack Unit (U) HPE Alletra Storage Server 4110.** This system is optimized to serve a variety of high-bandwidth, low-latency workloads including those tied to high-performance computing, AI, machine learning, and deep learning. It is well suited for industries such as life sciences and media and entertainment that run large video editing, rendering, and streaming jobs (and associated large backups).
- **The 2U HPE Alletra Storage Server 4120.** This system uses a mix of non-volatile memory express (NVMe) solid-state drives (SSDs) and hard disk drives (HDDs) to support workloads related to active analytics, file systems, object stores, video surveillance, and data protection.
- **The 4U HPE Alletra Storage Server 4140.** This system for bulk storage uses a mix of NVMe and HDDs to provide a high-throughput bulk storage aimed at active archives, backup with fast restore, and compliance/eDiscovery.

These storage servers are engineered with several key innovations that differentiate them from traditional commodity storage options, including the following:

- A symmetrical, balanced design to ensure that performance scales with capacity.
- Storage and memory resources in a shared-nothing architecture that are evenly spread across processors.

Overall, the design helps to ensure that these systems offer maximum performance, low latency, and high throughput as storage capacities scale.

Security Features

Beyond its symmetrical design, HPE Alletra also offers essential security functionality, including these three:

- Secure Boot to ensure that the operating system and supporting boot loader utilities have not been compromised on the storage server.
- Hardware Silicon Root of Trust to verify a list of digital fingerprints for Integrated Lights-Out (iLO) 6 firmware, unified extensible firmware interface, BIOS, and boot loader to ensure that the system will not be compromised at boot up.

- Optional self-encrypting drives with Federal Information Processing Standards (FIPS) 140-2 encryption to enable protection of data with a local or remote key. Without the key, the data is inaccessible.

Conclusion

It can make a big difference to a business when that business is using the right tool for the job. A storage server is not the same as a storage array, nor is it the same as a regular server. In fact, it is something in between and yet important. HPE has done some real innovation here, and the result is a solution that can address data growth issues, operational cost concerns, and IT complexity-related problems extremely well.

In general, the IT world has become too enmeshed in the storage-hardware-is-a-commodity mindset. Alletra presents a perfect example of why that viewpoint isn't always correct.

If you think general-purpose servers and general-purpose arrays are the same as a "storage server," then take a look at what HPE is doing with Alletra. You will change your mind. This purpose-built solution, designed to provide high throughput at scale, could be the right answer for your environment.

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