Solution Showcase

Flash Storage-based Data Protection with HPE

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Abstract: Solid-state storage has become pervasive in enterprise IT infrastructures, delivering high performance to mission-critical applications' data. In an all-flash world, it can be difficult to maintain the highest levels of data protection and end-users can't let backup and recovery processes introduce bottlenecks. A holistic approach that takes into consideration critical infrastructure components such as storage arrays, cloud service, and applications is needed to deliver enterprise-class data protection service levels. HPE offers these capabilities on the basis of a feature-rich portfolio and Intel-based solutions.

Solid-state Storage Has Become the New Norm

The face of data storage in enterprise data centers has changed in the past few years, with the advent of solid-state storage. This evolution of storage technology has now become pervasive in enterprise IT infrastructures around the world, with 49% of organizations surveyed by ESG indicating that they already use solid-state, also known as "flash" technology, and 38% reporting that they are planning to use or are currently evaluating the technology (see Figure 1).[1]
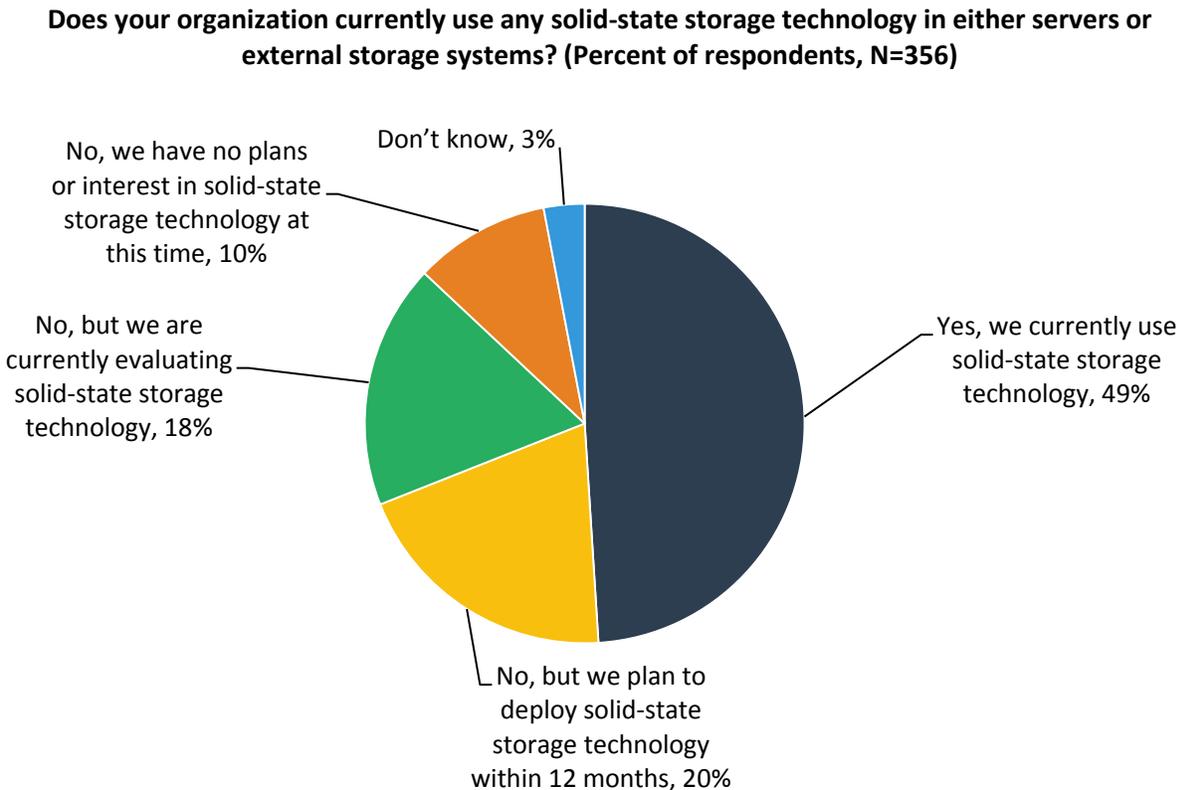
Not surprisingly, the technology is seen in many devices, from laptops to servers, but it has also revolutionized the storage array landscape, with 63% of organizations using solid-state drives in storage subsystems today, 35% in all-flash arrays, and 30% as extended cache within hybrid storage systems. When organizations were asked how they expect to deploy solid-state storage in the future, they reported similar adoption trends.[2]

Flash or solid-state drive technology has naturally become popular because it has allowed many organizations to realize a variety of operational and economic benefits, among which are the following, as discovered in ESG research:

- Improved application performance.

- Reduced power consumption.

- Improved resource utilization.

- Improved total cost of ownership (TCO).

- Reduced operational expenses and improved SLAs.

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[1] Source: ESG Brief, *Flash Storage: Growth, Acceptance, and the Rise of NVMe*, September 2017.
[2] Source: ESG Master Survey Results, *2017 General Storage Trends*, November 2017. All other ESG research references and charts in this solution showcase have been taken from this master survey results set, unless otherwise noted.

Figure 1. Use of Solid-state Storage

Does your organization currently use any solid-state storage technology in either servers or external storage systems? (Percent of respondents, N=356)

No, we have no plans or interest in solid-state storage technology at this time, 10%

Don't know, 3%

No, but we are currently evaluating solid-state storage technology, 18%

Yes, we currently use solid-state storage technology, 49%

No, but we plan to deploy solid-state storage technology within 12 months, 20%

The most advanced and promising next technological mainstream evolution for solid-state storage is for flash media to be used in conjunction with the NVMe protocol, which is essentially a method to access the media with much lower overhead. NVMe accelerates the data path to extend the level of flash benefits that can actually be enjoyed by its users. Multiple storage system and networking providers are invested in taking the benefits of NVMe outside of the box and delivering them across the greater storage network.

Protecting Flash Environments

As mentioned previously, performance is one key benefit of flash-based environments. More than half (58%) of current and potential users identified enhanced performance as a factor in their decision to deploy solid-state storage. With higher levels of performance providing fundamental IT and business benefits to many organizations, in an all-flash world, IT can't let data protection be a bottleneck. In many ways, it can be said that all-flash storage has redefined the game for data protection as it places new requirements on traditional processes.

The expectations for enterprise-class data protection are high, as stringent data protection mandates are expected by IT leadership, such as speed and agility of recoveries, reliability of backup and recoveries, and increased speed or frequency of backups. These mandates are directly tied to current data protection challenges.

Looking at these from a flash storage system perspective, in our opinion, these expectations translate into:

- No backup window time. In other words, organizations should leverage snapshots and equivalent mechanisms to capture data at any point in time, as often as needed, instantly.

- No interference with storage performance. It goes without saying that, with the promise and delivery of high-performance benefits, data protection processes will not affect the performance workloads and existing I/O processes.

- Recovery point objectives and recovery time objectives that need to be on par with or better than (given the performance boost) traditional storage. Data protection processes must not only not interfere, they must also keep pace with the increased performance of the technology.

On the features front, a number of capabilities are expected in enterprise environments, which are no different for flash-based topologies, and broadly include enterprise-class data protection features, such as:

- Data deduplication: Storage optimization leveraging the aforementioned deduplication is also typically required to optimize TCO and storage footprints.

- Application-consistent backups and hypervisor support: The scope of data protection goes beyond the individual storage subsystems and the data center itself to include the complete ecosystem of applications and hypervisors.

- Scalability to handle the deluge of data enterprises deal with.

- Ease of use: This has become an expectation across all market segments as many organizations are facing a shortage of IT skills.[3]

- Orchestration and automation of data (and application) recovery processes should these become necessary.

- Support of cloud layers (public or private).

Focusing on storage arrays, especially in high-performance storage architectures, array-based snapshotting and replication are must haves. As mentioned before, these functions must be performed with no impact to production workloads. Data capture with tight data source storage integration is expected as is data movement with direct data paths from primary to secondary storage.

A holistic approach is therefore needed, from storage array, to applications, to cloud destinations, to provide a full spectrum of data protection capabilities to high-performance flash-based storage environments. This is a strategic IT mandate that HPE has been working on with recent additions to its portfolio.

Storage-integrated Data Protection with HPE

Intel Inside

The HPE solutions are designed for resilience and performance from the ground up and leverage a strong and long partnership with Intel. Intel technology inside HPE servers and storage, including Intel Xeon processors and Intel SSDs, offers the performance, orchestration, and security features organizations need to better manage shared resources and modernize their data centers and support their IT service levels. HPE and Intel together provide these organizations with a range of innovations designed for optimized performance.

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[3] Source: ESG Master Survey Results, *2018 IT Spending Intentions Survey*, December 2017.

HPE 3PAR

HPE offers the 3PAR StoreServ family of mid-range and enterprise flash-optimized data storage systems for tier-1 data center environments and boasts a guarantee of 99.9999% data availability. The solution features a well-established high-performance and automated provisioning feature set and is designed for multi-tenancy. The Intel-powered hardware provides for built-in deduplication and compression and sub-1ms latency.

HPE Nimble

HPE Nimble Storage also leverages Intel flash storage and is designed for NVMe and storage-class memory (SCM). The Nimble family, well known for its signature predictive analytics, offers, like the 3PAR family, a guarantee of 99.9999% availability. It also includes native cloud integration with AWS, Azure, and cloud-native APIs. It is positioned as a very efficient family of arrays, with the ability to store more data per terabyte of flash storage than other all-flash arrays. It can also be combined with HPE Nimble Cloud Volumes for full cloud integration.

HPE Recovery Manager Central

HPE Recovery Manager Central (RMC) software integrates HPE 3PAR StoreServ All Flash Arrays with HPE StoreOnce Systems to provide a flash-integrated snapshot, replication, and backup service that augments traditional backup approaches. RMC allows for rapid recovery with non-disruptive, application-consistent local and remote snapshots.

RMC does not require an application server or a backup server in the data path, which significantly reduces performance impact on the application. RMC leverages SnapDiff technology in HPE 3PAR StoreServ, which means that only changed blocks are sent to the StoreOnce backup system. Every backup is quick, as it is essentially only an incremental that then gets combined into a synthetic full backup, which accelerates application recovery. This also gives end-users more granularity in achieving their backup and recovery point objectives by having many points in time available for recovery.

Storage-integrated data protection will be extended to Nimble Storage with the upcoming release of RMC 6.0. The new version of RMC will also include a new SLA policy engine, enabling the creation and automation of backup, replication, and archival SLA policies with just a few clicks.

HPE StoreOnce

The recently launched next generation **HPE StoreOnce** platform encompasses a broad range of deduplicated disk-based backup solutions, from virtual appliances and small form factors suited for SMBs and remote offices, to very large enterprise-scale deduplication platforms providing petabytes of deduplicated capacity. HPE StoreOnce provides fast backup and restore performance, multi-system management from a single pane of glass, and a range of security features including encryption (in flight and at rest) and protection versus ransomware attacks with the StoreOnce Catalyst protocol. It is a great companion to the HPE 3PAR and HPE Nimble product families through a number of integrations (including RMC), and can be combined with **HPE Cloud Bank Storage** software, which natively moves deduplicated backup data to the public, private, or hybrid cloud, enabling low cost and secure long-term retention and reliable disaster recovery.

ISV Ecosystem

HPE has created an ecosystem of data protection partners that provide a number of integration points to leverage the capabilities afforded by HPE's storage solutions. Two vendors in particular, Veeam and Commvault, have developed joint solutions with HPE.

Veeam software integration with HPE storage solutions allows end-users to create application-consistent backups from HPE storage snapshots for fast and efficient data protection. For long-term external storage, HPE StoreOnce provides

deduplication for efficient storage utilization and fault isolation for data. Veeam integration with the HPE StoreOnce Catalyst protocol enables secure backups and restores with greater speed and efficiency.

Commvault's comprehensive backup and recovery solution leverages snapshot integration with HPE storage to meet demanding recovery (RTO/RPO) requirements. The Commvault data platform is tested and validated with HPE primary and secondary storage solutions, including HPE StoreOnce Systems, 3PAR StoreServ, Nimble Storage, and HPE Apollo and ProLiant servers.

Commvault recently announced integration with StoreOnce Catalyst, which includes Commvault support for Cloud Bank Storage for simplified cloud backup, source side deduplication, automated data aging, synthetic full backups, and replication from one StoreOnce system to another StoreOnce system for DR purposes.

The Bigger Truth

The realized promise of flash is first and foremost related to performance and efficiency. This technology has fundamentally changed storage and IT infrastructure dynamics in the data center, but it has also created a new set of requirements in the broader ecosystem, in particular for data protection. In order to maintain the benefits delivered by flash storage technology, data protection processes have evolved to keep up with the amount of data and the speed at which it can be handled in storage.

HPE's storage portfolio is designed for high performance, leveraging the most modern storage technologies and its partnership with Intel. It also includes a broad set of storage, software, and service solutions coupled with a strong vendor ecosystem to deliver against modern enterprise data protection requirements and service levels.

The constant innovation HPE is delivering is especially visible in its recent announcements, in particular the announcement of next generation StoreOnce and RMC 6.0. This makes the HPE portfolio particularly attractive to any organization looking for an optimized flash-based performance infrastructure with enterprise-class data protection.