

Solution Showcase

All-flash Arrays Can Fit Within Hybrid Storage Infrastructures

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Abstract: As enterprise IT organizations continue to expand their reliance on digital information, the competitive landscape will continue to be defined by those that quickly amass, digest, understand, and utilize that information. In recent years, solid-state storage has emerged as a powerful tool in the arsenal of IT organizations because it can be used to harness the power of data both quickly and efficiently. Last year, IBM, a leader in the solid-state industry with its FlashSystem family, unveiled two all-flash array offerings—Storwize V7000F and Storwize V5000F. These arrays balance ever-increasing affordability and performance with storage and virtualization functionality to assist IT organizations in better leveraging solid-state to their business advantage.

Introduction¹

With the increasing amount of data being stored, along with the growing importance of that data for staying competitive, the days of a single-tier storage infrastructure are behind us, probably permanently. A one-size-fits-all approach is too costly and inefficient. Solid-state technology offers a platform-enabling performance that is vastly superior to what is possible with spinning-disk storage. As a result, organizations are better able to adjust their storage infrastructure to the specific needs of their workloads.

Low-latency/high-performance applications such as IBM DB2, Oracle, and SAP, as well as virtual desktop infrastructure (VDI) and server virtualization efforts are all well suited to solid-state storage. By deploying a workload-centric storage infrastructure with solid-state, organizations can leave spinning-media storage to do what *it* does best: serving sequential input/output operations (I/Os) and providing capacity for less cost than even the increasingly affordable flash of today.

That kind of segmentation is a result of a desire to provide the performance and capacity demanded by business workloads while keeping IT budgets under control. For many organizations, the result is a hybrid storage “ecosystem” in the data center, where solid-state storage and all-flash arrays serve the needs of the most demanding applications.

As part of a 2015 research study investigating general storage trends, ESG surveyed 373 IT decision makers responsible for their organizations’ data storage environments.² When the respondents were asked to identify their must-have storage features, their most common answer was high availability. Solid-state was also among the top-ten most common responses, but overall, the results pointed to a “hierarchy of needs” by IT organizations. Their top priority is to ensure data is online and available.

¹ ESG originally published this Solution Showcase in August of 2015 and is now updating it to reflect IBM’s current technology offerings.

² ESG Research Report, [2015 Data Storage Market Trends](#), October 2015. All ESG research references and charts in this Solution Showcase have been taken from this research report.

Similar to Maslow’s hierarchy of needs,³ IT organizations must first fulfil their basic need for high availability. [IBM](#), a leader in solid-state storage today, understands that fact. Newly updated with more cost-effective drives, IBM’s Storwize V7000F and Storwize V5000F are elements of the field-proven IBM Storwize family, providing high availability and a full complement of data protection functionality including snapshots, cloning, and replication. According to the vendor, it has shipped more than 119,000 systems (281,000 enclosures), representing 5.3 exabytes of capacity deployed worldwide. Clearly, IBM has demonstrated a history of reliability in data center environments.

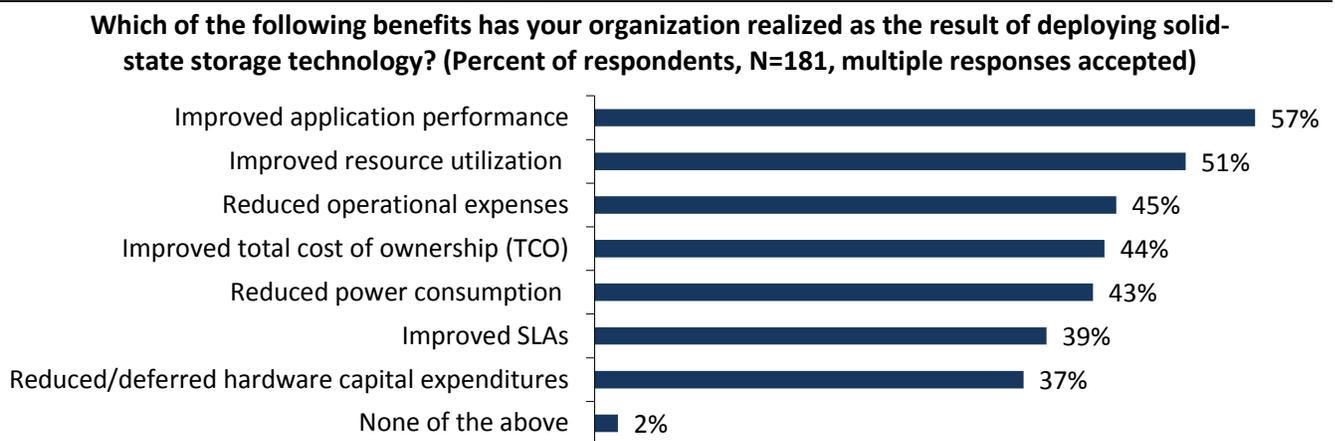
Analysis

In 2015, when ESG asked IT decision makers to identify which factor was most responsible for their organization’s deployment of solid-state storage, respondents cited improved performance most frequently (23%). Surprisingly, however, the second most popular response was improved reliability/mean time between failures, cited by 15% of respondents.

Not too long ago, the historically conservative storage industry was concerned about the reliability of “new-at-the-time” solid-state storage. The fact that improved reliability now is the second most frequently mentioned adoption factor indicates that whatever concerns the industry had about reliability may have vanished.

Current solid-state users were also asked to identify the benefits their organizations have realized from solid-state. The most-often cited benefit, improved application performance (57%), won’t surprise anyone. The interesting responses were the ones that followed: The second, third, and fourth most-cited responses were improved resource utilization (51%), reduced operational expenses (45%), and improved total cost of ownership (44%) (see Figure 1).

Figure 1. Benefits Realized as a Result of Deploying Solid-state Storage



Source: Enterprise Strategy Group, 2016

All of those benefits are indicative of the ripple effect that dramatically improved storage performance can have on a data center. Throughout much of IT’s history, persistent storage required mechanical spinning-disk platters—devices that often became perpetual bottlenecks, limiting the performance of the applications and workloads that relied on them. The data center-scale benefits identified in Figure 1 reflect the great possibilities to be achieved by removing such bottlenecks.

The New IBM Storwize V5000F and V7000F Offerings

With levels of affordability (recently enhanced by cost-effective solid-state drives that push deployment costs down dramatically) and functionality targeted to midmarket environments, Storwize V5000F and Storwize V7000F offer capabilities intended to provide organizations with great TCO and to ease their efforts to integrate solid-state technology

³ Maslow’s hierarchy of needs is a psychological theory postulating that humans must satisfy their basic needs for food, water, and shelter before they can pursue higher-level needs and eventually achieve “self-actualization.”

into the data center. Offering a blend of high performance and high availability with a mix of storage protection and virtualization features, the Storwize portfolio provides capabilities and benefits including:

- **Simple, cost-effective, all-flash storage**—Even when IT organizations see benefits related to application performance and better TCO, they are still beholden to their budgets. IBM has tried to ensure that V5000F and V7000F offer compelling entry prices, which can help to keep CapEx in check and provide a solution that is aligned to a midsized IT organization's budget. Both products now come with a much more attractive deployment price thanks to higher-capacity, more cost-effective drives. It is a trend IBM will undoubtedly continue as further advanced, attractive-purchase-price flash implementations become available. And in regard to simplicity, IBM has focused its development resources to design an intuitive management system. When combined with the capabilities of IBM Spectrum Virtualize, those capabilities can be incredibly powerful and should keep management relatively simple.
- **Extensive storage functionality in a high-performance package**—With all-flash arrays, as with other forms of solid-state storage, the focus is on performance. Storwize delivers it. But solutions *also* require compelling features. These newest Storwize offerings provide the gamut of IBM Spectrum Virtualize software—external virtualization, IBM Real-time Compression, thin provisioning, snapshots, cloning, and replication. According to IBM, the compression technology can provide up to a five-to-one compression ratio, reducing physical drive space up to 80%. The resulting improvement to storage efficiency makes Storwize appropriate for more cost-sensitive buyers. Additionally, the 2U form factor offers the potential for space and power savings.
- **Data virtualization with Storwize for a hybrid ecosystem**—By incorporating the data virtualization technology, virtualized storage can become part of the Storwize system and inherit all its functionality, including Storwize management. This abstraction layer also enables data movement from one system into an alternate or new storage array while maintaining data accessibility for nondisruptive data migration. IBM understands that even with the benefits of solid-state storage, many organizations may be better served by a hybrid IT ecosystem for the time being. Allowing Storwize to manage multiple storage architectures as if they were a single platform provides the potential for even greater CapEx and OpEx savings.

ESG also polled IT decision makers about the percentage of their organization's applications/workloads that require solid-state performance levels. With responses varying from less than 10% to as much as 50%, the results reinforce the earlier point that, for the foreseeable future, storage across the data center will likely remain a blend of solid-state and spinning disk. IBM's integration of Spectrum Virtualize technology illustrates its understanding of this reality: Storwize serves as a key component of a hybrid data center offering multiple tiers of storage to serve a variety of workloads.

The Bigger Truth

Solid-state storage should no longer be considered an emerging technology; it has emerged. ESG's research revealed as much, as respondents listed improved reliability as a major benefit. In addition to the industry's general interest in and strong perception of solid-state, ESG has identified a range of specific benefits that organizations using solid-state now enjoy. The evidence is overwhelmingly compelling in favor of adding solid-state storage technology as a component of a data center.

Typical data centers house myriad applications and workloads, each with their own specific requirements. Some workloads may be ideal for solid-state storage; others, less so. IBM understands that not only do organizations need cost-effective and capable solid-state storage, but they have other needs, too. IBM has endeavored to make Storwize all-flash storage functional and accessible, and the inclusion of Spectrum Virtualize reflects IBM's belief that hybrid storage environments will likely exist for the foreseeable future.

[Try the ESG ROI calculator](#) to find out how much value IBM Storwize might drive for your business.

Instead of trying to push one type of storage technology or another, IBM has designed a solution that allows organizations to embrace multiple storage architectures, even as it makes managing those technologies easier. The result is that Storwize all-flash systems provide TCO benefits for workloads that demand solid-state—and the “line” at which workloads can “qualify” for solid-state is expanding rapidly as IBM is incorporating ever-more-cost-effective flash into its Storwize all-flash systems. And, importantly, Storwize extends those TCO savings by consolidating the management of multiple tiers of storage in a single platform. Even as IBM looks to continue to drive down the overall TCO of hybrid-all-flash systems—a basic need—it is not doing so at the expense of higher-level functionality requirements. That’s something Maslow would no doubt applaud.

In the end, IT decisions are business decisions. New technology deployments should improve the bottom line. ESG’s research shows that solid-state is already affecting multiple organizations for the better, and IBM’s storage portfolio looks to extend those benefits one step further.

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