

# Performance Through Acceleration

STORAGE ACCELERATION EMERGES AS A COST EFFECTIVE SOLUTION TO ADDRESS CONSTANT PERFORMANCE CONCERNS ABOUT VIRTUALIZED ENVIRONMENTS.



The growing trend toward virtualized environments has opened the door for organizations to enjoy a host of benefits, including data center consolidation, extended application life, as well as simplified provisioning. However, at the same time, the consolidation efforts have increased the workloads on the host, resulting in system bottlenecks, as well as less-than-ideal storage performance. As a result, organizations of all sizes are constantly dealing with how to improve storage performance without further taxing already tight budgets.

A recent IDG Research Services Market Pulse survey provides insights into how organizations are currently addressing storage related issues and how they are faring in their quest. This paper explores those issues and examines how businesses could more cost effectively improve the outcome.

## » Environmental Assessment

The growing reliance on data and continued proliferation of virtualized server environments is rapidly making storage management a priority. This trend comes through crystal clear in a recent IDG Research Services survey, specifically when IT leaders are asked about storage-based challenges. Meeting application performance requirements (53 percent), controlling rising storage costs (37 percent) and addressing storage I/O

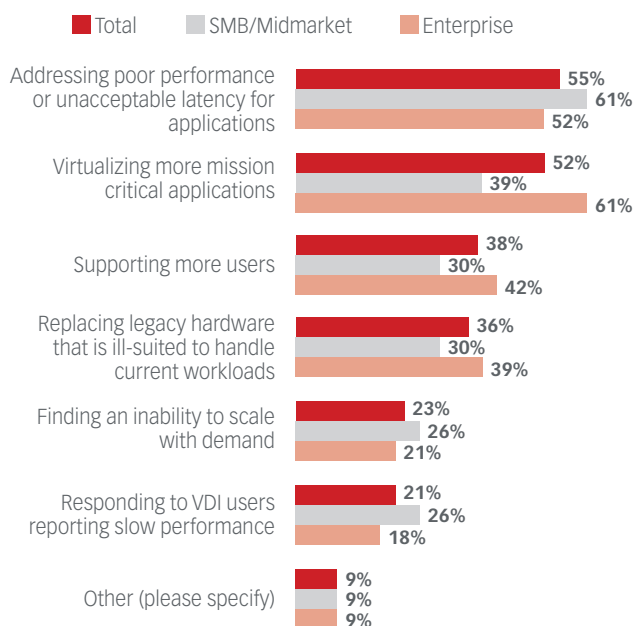
bottlenecks (36 percent) are top challenges, exacerbating the ever present struggle to manage the growing volumes of data.

The top two concerns of data growth (cited by 73 percent of respondents) and the growing need to enhance performance are very much entwined, says Peter Smith, vice president of product management with Cambridge, Mass.-based Infinio, a leading provider of storage performance solutions. “As the data growth trend continues to compound, companies are spending so much time thinking about how to deal with capacity that performance has become somewhat of an afterthought,” he says. “Fortunately, the tide is starting to change with the connection between the two crystalizing.”



## DRIVERS OF STORAGE PERFORMANCE IMPROVEMENT

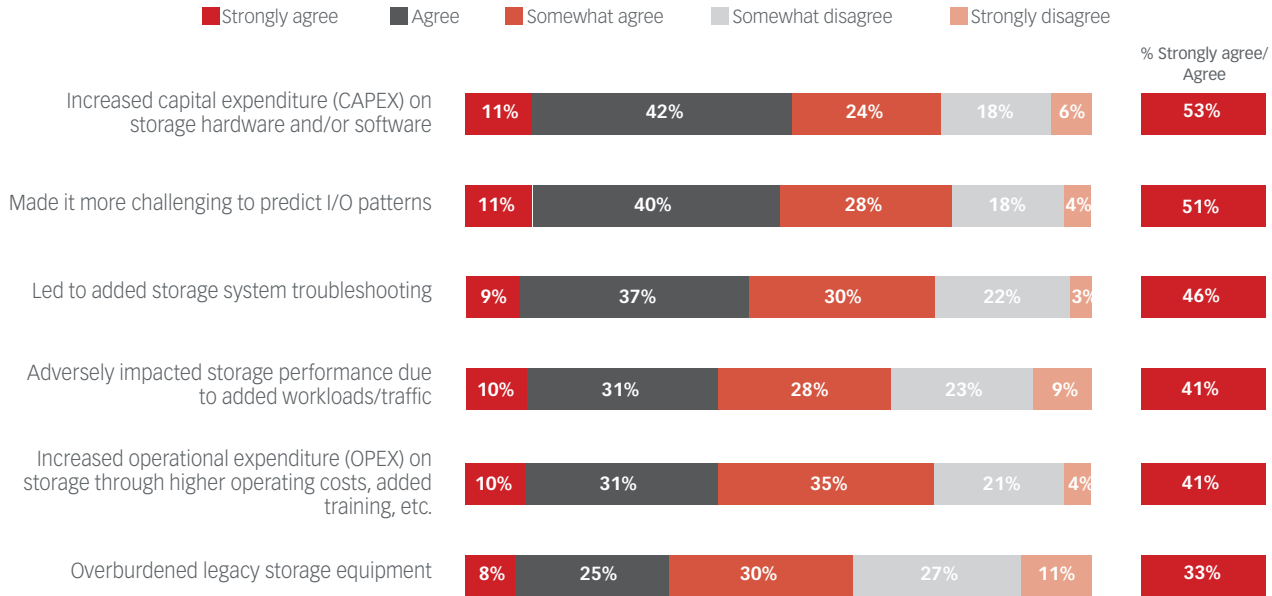
Over half of all organizations are looking to improve storage performance, particularly enterprises who are virtualizing more mission critical applications and are experiencing poor performance or unacceptable latency for applications.





## ADVERSE STORAGE CONSEQUENCES RESULTING FROM SERVER VIRTUALIZATION

Despite the many favorable benefits of server virtualization, over half of respondents agree that it has increased CAPEX on storage hardware/software as well as made it more challenging to predict I/O patterns.



TOTAL BASE: 101; Q2: PLEASE RATE YOUR AGREEMENT WITH THE FOLLOWING STATEMENTS. WHEN IT COMES TO MY ORGANIZATION'S STORAGE, THE USE OF SERVER VIRTUALIZATION HAS.

In addition to data growth's impact on storage performance, the ongoing move toward increasingly more virtual environments is playing a significant role in driving the need for improvement, especially when considering its impact on mission critical applications. Furthermore, despite the many favorable benefits of server virtualization, more than half of the respondents agree that it has resulted in increased CAPEX on storage hardware and software (53 percent).

Respondents also cite that virtualization makes it more challenging to predict I/O patterns. After all, while virtualization helps with consolidation, it introduces new problems that many stacks aren't always equipped to handle. As an example, compare a single server that is hosting various virtual machines and the instance of a desktop and a hard drive. The individual drive has the ability to adequately support the load of one desktop. However, when combining multiple desktops and placing them on a collection of hard drives, the bulk of drives cannot necessarily support the load of all the desktops.

"This is the I/O blender effect that impacts many virtual environments, and it occurs primarily because the system was not designed for the resulting chaos," Smith says.

### » Taking Action

The good news is that IT leaders are well aware of the need for improvement, with more than half of all respondents looking

to improve storage performance. And, fortunately, there are a number of steps organizations can take to improve performance.

In addition to undergoing a system tuning process to make meaningful differences up and down the stack, organizations can prioritize workloads to ensure that network CPU, bandwidth and resources are allocated based on business priorities. "This is more of a subtractive approach of taking resources away from a lower priority system to make sure a higher priority system has what it needs to deliver," he says.

On the flipside there are additive approaches to improving storage performance. According to the survey results, organizations have historically tackled storage performance problems by upgrading the storage array to a newer model or adding more spinning drives to existing arrays. However, taking the additive approach does not have to be disruptive. For instance, adding I/O optimization to the mix can significantly improve performance by offloading demands from downstream components in the stack.

While upgrading the storage array to a newer model may have been the most common resolution to address storage performance problems in the past, just 32 percent of respondents now prefer that option.

This rings true for one survey respondent, an IT leader with a large governmental unit. The approach his organization selected

to address storage performance issues approximately one year ago proved to be a frustrating endeavor. "After receiving budget approval, we elected to upgrade our entire storage array," he says. "Obviously, as with any change, we knew the potential for delays existed, we did not properly plan for the lengthy disruptions, nor did we account for the associated costs of change management," he adds in hindsight.

### » Understanding Storage Acceleration

The move toward storage focused I/O optimization – also known as server side caching or storage acceleration – is the direct result of evolutionary steps away from the historic practice of purchasing performance and capacity together. Even with performance-optimized storage solutions, there is still a lot of focus on capacity. When more performance was needed, the easiest thing to do was to buy another shelf of drives. While enterprises might not have even needed the capacity, there was a dire need for performance.

The introduction of flash, and more recently SSD, added a new level of efficiency with its incredibly high ratio of performance to capacity. According to the survey, 65 percent of IT leaders have deployed flash or SSD to some extent. However, this approach introduces new challenges including various flash specific sensitivities. As a result, introducing flash to a legacy controller results in added complexity. In addition, 53 percent say the cost of deploying flash into an existing environment and the cost of new flash-based solutions are top barriers.

Ultimately, storage acceleration involves separating the performance from the capacity function of storage and providing capabilities on the server side using host resources. At the core, storage acceleration is a reaction to this historical way of accomplishing performance issues. Through server side caching, the organization has the ability to offload the downstream storage component and bring the data close to the application that needs it for computation.

According to survey results, 49 percent of IT leaders are either using server side caching or have plans to deploy it within the next 12 months. And, the non-disruptive nature of storage acceleration is an important factor, considering that 86 percent say that limiting or eliminating environmental disruption is a key consideration when investing in storage performance solutions.

The economics of embracing storage acceleration are also quite attractive because it is far more cost prohibitive to buy hardware within the storage systems (i.e. SSDs) than it is to buy resources on the server side. In addition, many servers are already over-provisioned from a CPU core and memory perspective, which was echoed in the survey. Specifically, 62 percent of respondents cite an abundance of CPU processing capabilities in addition to 54 percent, who identify memory as an excess resource.



## Sometimes Size Matters

While many of the trends identified in the IDG Research Services survey are relatively consistent across all industries and organizations, a handful of notable differences emerge when comparing large enterprises to their mid-market counterparts.

For instance, controlling rising storage costs associated with an expanding volume of data was cited significantly higher by enterprises than by their midmarket counterparts (49 percent enterprises vs. 23 percent midmarket).

There were also preferential differences when looking at how specifically to address performance problems. Midmarket organizations prefer to address storage performance problems by redesigning the storage architecture (52 percent vs. 26 percent), whereas enterprises would prefer buying an all-flash or hybrid array. Enterprises are also more likely to deploy I/O optimization (40 percent vs. 27 percent).

Lastly, large enterprises are much more likely to report deploying flash or SSDs to servers than midmarket businesses (40 percent vs. 19 percent). Yet, midmarket respondents are most likely to deploy flash for general performance improvement, while enterprises are most likely to deploy flash tactically for a specific application (38 percent midmarket vs. 28 percent enterprise).

Addressing storage performance without a solid understanding of the root cause can easily introduce new issues. For instance, addressing bandwidth needs may prompt upgrades in servers, generating substantial additional workload that can congest the array interfaces. This understandably creates a snowball effect leading to added investments to solve newly created issues. "A more direct approach is to address the series of bottlenecks downstream by funneling the data into a local cache capable of reducing the burden on all the downstream limitations," Smith says.

Looking ahead, Smith anticipates the trend will only continue to evolve and reshape the storage space. "What we see longer



## Infinio's Software-based Approach to Performance

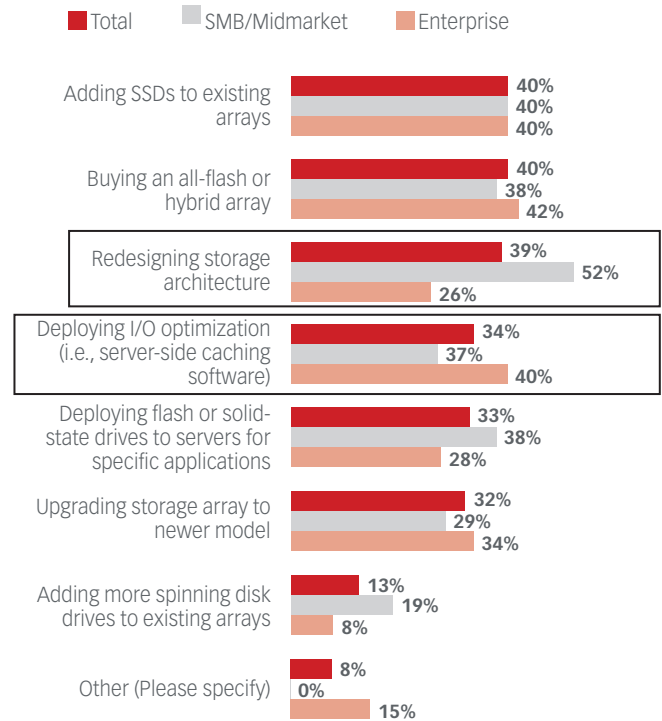
Distance is a pervasive theme in IT, primarily because of its impact on latency and throughput. The underlying theme is that that data has mass, so bringing the computation to the data helps reduce throughput issues. This is where storage acceleration can make a significant difference. It is participatory server side hosting of content frequently used by critical applications rather than unnecessarily taxing the often-overwhelmed storage system. Below are some of the distinctions of Infinio's approach:

- Software-based** – With Infinio, there is no need to add SSD, memory or flash to the existing environment. As a software-based solution, Infinio leverages underutilizing and often abundant resources to power a server side cache capable to improving storage performance. The solution is able to leverage memory resources as a server side cache with de-duplication technology, leaving the format of data on disk intact.
- Disruption-free** – Infinio is completely transparent. It installs without any disruption and updates without any downtime. Depending on the commonality, benefits can be seen within an hour of installation. This takes into account IT's goal of optimizing operational practices. After all, having a shift of operational practices to resolve any issue can be rather disruptive.
- Seamless operation** – The Infinio solution downloads and installs in roughly 30-minutes. The caching begins immediately. There is no need to make any changes to storage operations. No change management is required. The software can slip in and out of the I/O stream without a blip.
- Cost effective** – When compared with all flash or hybrid arrays, the economic difference is staggering. And there is no need to retrain staff on use and reporting.



## HOW ORGANIZATIONS WOULD LIKE TO ADDRESS STORAGE PERFORMANCE PROBLEMS

Ideally, SMB/midmarket organizations would prefer to address storage performance problems by redesigning the storage architecture; enterprises would prefer buying an all-flash or hybrid array; enterprises are more likely to deploy IO optimization.



Q4: HOW WOULD YOUR ORGANIZATION IDEALLY LIKE TO HANDLE STORAGE PERFORMANCE PROBLEMS IN THE FUTURE? TOTAL BASE: 101; SMB/MIDMARKET BASE: 48; ENTERPRISE BASE: 53

term with storage acceleration is that it will become a layer, especially within virtualized environments where we provide all the performance for storage, and storage becomes nothing more than capacity," he says. "Storage acceleration is ushering in a fundamental change where organizations will increasingly have centralized storage that is used only for capacity."

For complete survey results and to learn more about how your organization can cost effectively improve performance by embracing a storage acceleration solution [click here](#). ■