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Use Analytics and Automation to Unlock Storage Performance

The 451 Take

Over the course of the last decade, we have seen rapid adoption of all-flash storage arrays that provide customers with increased performance and improved reliability compared with the disk-based systems they replaced. All-flash arrays have delivered important improvements in transactional and throughput performance, but many organizations are still struggling with performance deficiencies. While flash and consistent hardware improvements to the processing and networking (e.g., Fibre Channel SANs) of array controllers can positively impact infrastructure, it is clear that we need intelligent and proactive automation and management tools to get the most value out of these powerful storage systems.

Although flash storage is likely the future for production workloads, disk still has a significant cost advantage on a price-per-GB basis. Workload placement and optimization are key areas where improvements can have a major impact. For example, intelligent tiering could help organizations make sure that expensive, high-performance resources are being used by 'hot' workloads that require such performance, while 'cold,' infrequently accessed workloads are automatically tiered to less expensive disk or cloud storage options where appropriate. By freeing up high-performance resources, proactive customers can prolong the usability of arrays and eliminate the need to add new arrays to handle the burden.

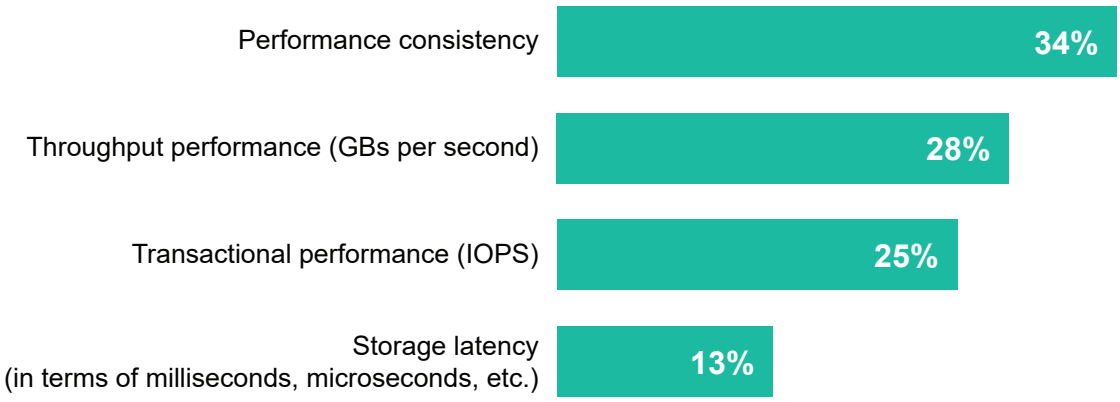
Storage systems are usually shared resources that are handling multiple workloads simultaneously. Administrators need to ensure that any performance spikes that occur do not negatively impact adjacent workloads running on the same physical system. Analytics and automation will have a role in helping arrays juggle resources to ensure that outages do not occur when misbehaving or overactive applications consume too many resources.

Organizations Want Improved Performance Across Multiple Dimensions

Source: 451 Research's Voice of The Enterprise: Storage, Transformation 2020

Q. Which performance aspect of storage would your organization want to improve the most?

Base: All respondents (n=407)



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Business Impact

In 451 Research's Voice of The Enterprise: Storage, Transformation 2020 survey, we found that a range of performance improvements were required to help customers handle current and future workloads (see figure above).

PERFORMANCE CONSISTENCY IS THE TOP AREA FOR IMPROVEMENT. Storage arrays today are deployed to simultaneously handle multiple workloads, and this burden has only gotten more critical with the rise of VMs over a decade ago and the more recent growth of containers. Consistency is a key issue because sudden performance drops could lead to outages and also severely impact customer experience. With consistent performance, IT teams will be able to spend more of their efforts on enabling innovation instead of burning precious cycles extinguishing problems.

THROUGHPUT PERFORMANCE IS A GROWING REQUIREMENT. High throughput is necessary for handling large-scale unstructured data workloads such as media files, medical images and research data, and these workloads will only grow in the future. But even if your organization isn't in media and entertainment or a vertical field such as life-sciences research, throughput performance should be an important consideration. High throughput is also important for speeding up backup jobs and for migrating workloads between storage systems, which most mainstream organizations are struggling with today.

IOPS AND LOW LATENCY CONTINUE TO SET THE BAR. Transactional performance is usually the first thing that comes to mind when organizations talk about performance issues, and the prospect of hundreds of thousands – or even millions – of transactions per second at low latency will be highly attractive to many customers in the future.

Looking Ahead

Organizations are already struggling to keep up with the ever-changing performance demands of applications, and these challenges will only be worse going forward. Just as automation has been the ingredient that made provisioning rapid in the cloud, the same automation benefits need to be applied in the areas of infrastructure monitoring, management and optimization. Modern infrastructure management teams will need to leverage automation to allow their environments to adapt and optimize based on workload demands and business value. In this space, vendors are releasing starter packs and plugins to help customers accelerate their automation efforts.

It is increasingly clear that intelligent, proactive management tools (analytics and automation) are required to maximize the value of modern storage systems. Over the last few years, infrastructure management tools leveraging artificial intelligence and machine learning enhancements have entered the market to provide customers with proactive warnings and other insights to reduce the management burden for IT administrators. In the aforementioned Voice of the Enterprise study, 32% of organizations said they had AI/ML-enhanced management and monitoring tools in use already, while only 25% of survey respondents said they were not considering deploying them – which suggests that many organizations are still working on improving their management capabilities.

Today, these tools can help identify where workloads can best be located to maximize the investment in flash storage, while end-to-end monitoring can help isolate performance bottlenecks wherever they may be located, from virtual machines through the network to the storage itself. Looking ahead, these infrastructure management tools will gain even deeper insights not only from infrastructure components such as servers, storage and networking, but also from applications, clouds and other sources. Knowledge from sources such as professional services, security and compliance professionals could soon be fed into management tools to provide even deeper insights based on real-world experience.