

STORING THE DATA TO POWER YOUR AGENCY



PURESTORAGE

Executive Research Brief

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▶ INTRODUCTION

Every day, government agencies grapple with new data challenges. Constrained resources and increased workloads require organizations to become more efficient in how they acquire, store, use, and analyze data. Transparency initiatives mandate agencies to provide access to data sets in open, machine-readable data formats. The public expects a new level of service in which data is presented cleanly and quickly, as it would be from any private online provider.

Coupled with the need to reduce the number of data centers and optimize the ones remaining, technology staff are looking at a range of solutions, including new storage options, to address new demands. They're finding that solid-state, flash storage—once an expensive component in supercomputing applications—has become practical for data centers.

To discuss how flash storage can replace disk-based storage and help government organizations achieve these various goals, we spoke with Vaughn Stewart, Chief Evangelist; Sandeep Singh, Director of Product Marketing; and Jason Nadeau, Director of Business Value Marketing, at Pure Storage. GovLoop also surveyed more than 150 public sector employees to discover how their agencies leverage storage solutions to address new challenges.

Referring to enterprise-level storage, Stewart said government organizations, “generate data that is stored, and very rarely deleted. And then storage becomes basically a mass.” Flash storage, and Pure Storage flash arrays in particular, provide that transformation to manage that mass.



NEW CHALLENGES

FOR GOVERNMENT ORGANIZATIONS

The technology challenges government faces are varied and complex. They include the need for big data analytics to drive mission performance, transparency to build public confidence, mobility to serve federal employees and their constituents, and cybersecurity to protect critical infrastructure and services. Agencies struggle to execute these initiatives.

BIG DATA & ANALYTICS

Multiple data sources, disparate data types, and sheer data set sizes come together in the big data phenomenon. While hard to manage, big data promises to yield new and valuable insights when combined with the right analytical tools.

To manage big data, an agency's IT infrastructure must be highly scalable, rapidly accessible to multiple applications, and flexible. At the same time, agencies must acquire these capabilities without exponentially expanding their operations budget. "We live in a day and age where we need to interconnect multiple datasets," said Stewart. This is especially true for government agencies, which are being asked to increase efficiency while maintaining ever-larger data collections available online with minimal latency.

TRANSPARENCY

"Something that we are hearing a lot about, especially within the open data movement, is increased transparency," said Stewart. The **Digital Accountability and Transparency Act**, which requires all federal financial spending to be documented in a standard,

machine-readable format, is matched by executive branch policy that agencies default to transparency.

"Now more than ever, you have to have a storage system that allows you to use your data optimally, and to put it out there for the public in a really transparent and accessible way," added Stewart. To meet transparency demands, agencies require a data storage system that accommodates more users without increasing latency of access.

MOBILITY

In addition to internally maintaining complex data sets, agencies must make data more accessible in a variety of settings. The mobility revolution has not bypassed government. Tech-savvy citizens expect government services to be available from any device, anywhere. In order to deliver mobile services, agencies must optimize the infrastructure that supports mobile users.

Nearly half of our survey respondents said that the increased use of mobile devices causes their agency to reconsider its storage strategy. To maintain acceptable service for mobile users, IT managers need to take into account the

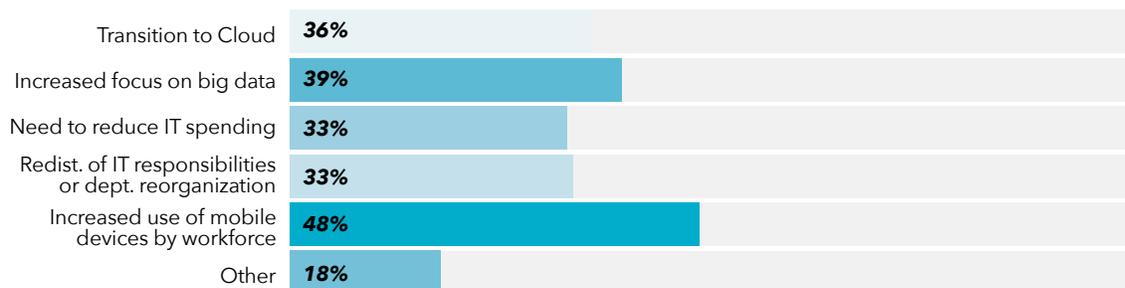
response latency induced by crowded wireless internet and cellular networks. One way to compensate is by reducing server response latency with faster storage.

Employee retention and morale are also concerns that agencies will address with mobile options. Increasingly, telework solutions that require virtualized desktops and other mobile features are being used to offer flexible work schedules to public sector employees. With the increase of department-wide mobility deployments, processor demands and what used to be local disk storage are now moving to servers in the data center.

CYBERSECURITY

Finally, as the amount of data sets and information access points increase, the potential targets for cyberattacks will also grow. To safeguard sensitive information, government organizations must secure every component of their IT infrastructure. In particular, attention should be given to protect storage solutions because it is not only a repository of classified documents but also a platform connected to nearly all other agency applications. An insecure storage solution can compromise security at all levels of an organizations.

what agency changes or transitions encourage you to re-evaluate your storage strategy? (check all that apply)



total respondents: 141



BARRIERS TO SUCCESS

Agencies attempting to meet these new demands for increased analytics, mobility, and virtualization often find that their IT infrastructures aren't up to the task. A primary stumbling block is the current state of storage solutions.

Specifically, many agencies continue to rely on traditional disk technology for their more critical or frequently accessed data. Disk arrays are equipped to house large amounts of data. However, to attain exponentially faster read-write capabilities and large reductions in space and power consumption, it's time to consider flash storage.

As agencies are tasked with leveraging data in innovative, new ways, disk-based storage solutions are becoming less applicable. Not only are they unable to support the advanced functionality of modern government digital services, they also require an unsustainable amount of resources to function long-term.

LATENCY OF ACCESS

"The new focus in storage is on latency," said Stewart. "In other words, how quickly does the storage subsist and return the information that you're seeking? Reduced latency on a simple level provides a better quality of experience with an application view." As agencies attempt to use disk-based storage to explore large data sets, they are finding the user experience to be subpar thanks to the inherent latency in even the fastest disk arrays.

UNRELIABLE ACCESS

Agencies also face access challenges. "Today's world with our hyper-connectivity doesn't allow us to have maintenance windows with degraded performance anymore," said Stewart. "The world doesn't allow you to slow

down anymore, so performance has to be tied in with system availability numbers."

While any storage system requires periodic maintenance, traditional disk-based storage solutions require more labor and time intensive troubleshooting. According to a recent GovLoop survey, complicated administration procedures, difficult or persistent troubleshooting, and unreliability are all challenges associated with their current data storage infrastructures. This maintenance disrupts workflows, disconnects users from agency services, and requires IT staff to work longer hours.

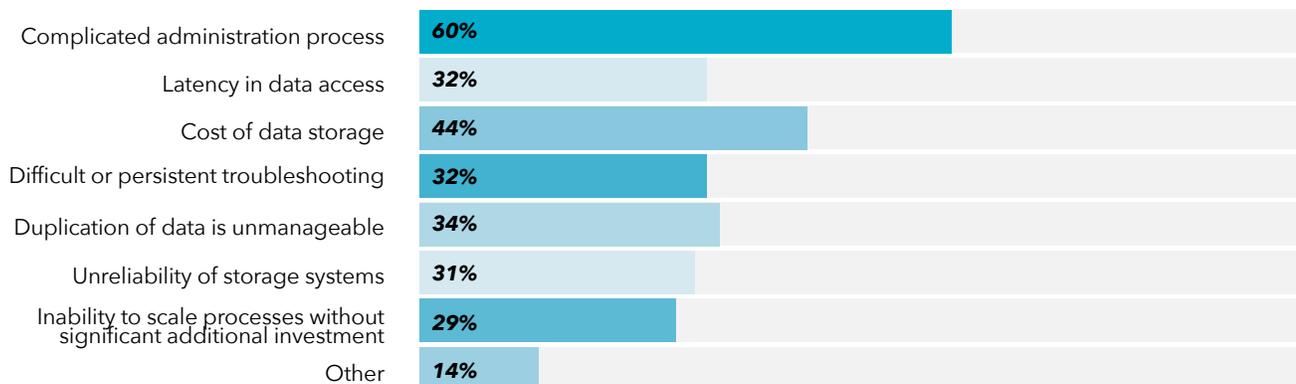
CONSTRAINED RESOURCES

In addition to being unable to support the functionality agencies require, disk-based storage consumes resources at an unsustainable rate. From a maintenance perspective,

disk space requires IT know-how to run the system. The installation of additional space, a common requirement for agencies with growing data sets, is also time consuming for staff. Finally, agencies must constrain the growth of data centers, along with the space and power costs they entail. Stewart asserted, "Regardless of which agency you're in, the world of global IT is being stressed with data resource constraints. Data centers are out of space."

It's not hard to see why rotating disk storage presents a target for streamlining, cost cutting, and optimization. Stewart explained, "Disk storage is the last mechanical component in the data center. It's large, it generates a lot of heat, and it draws a lot of electricity for the moving parts." As agencies require more data storage, these resource demands will only increase, even as agency budgets shrink.

what challenges are associated with your current data storage infrastructure? (check all that apply)



total respondents: 141



FLASH STORAGE SOLUTIONS

IT supports every mission, and storage supports IT operations. A solution especially suited to support modern initiatives without adding additional resource burden is flash storage. In contrast to disk-based storage, flash storage is better equipped to use data. "This is storage that sits behind big data, databases, analytics, and storing information for users or transactions," Stewart said.

This performance-focused storage runs on solid state, flash memory within the enterprise datacenter. It provides fast processing speeds and, as an added value, flash storage solutions use inline data reduction algorithms to maximize the utility of available capacity.

Stewart explained that flash storage can, "significantly increase productivity, drive more initiatives forward, complete tasks correctly, and help impact goals of agency missions." It does so by enhancing the usability of agency data and reducing resource constraints.

USABILITY IS ENHANCED

Given its ability to support large data sets while speeding up application performance, flash storage allows users to pull up information with noticeably less latency. "Any application that moves onto flash storage becomes more responsive and allows for greater satisfaction of the end user," explained Stewart. This is not only important from a functionality standpoint, but also from a user engagement perspective.

Flash storage's ability to support virtualization also enhances the user experience. When multiple virtual machines reside on a single server or cluster, disk speed can become a limiting performance factor. Flash storage overcomes this limitation because flash drives operate at the speed of memory.

"The public measures the quality of engagement with these online services against their day-to-day engagements," said Stewart. "Flash

can make those experiences for the end users on par with their day-to-day personal online exchanges and can significantly reverse that quality of service. It feels modern, it feels up to date, and though the interfaces may not look like the Internet, the response and the return feels like the Internet."

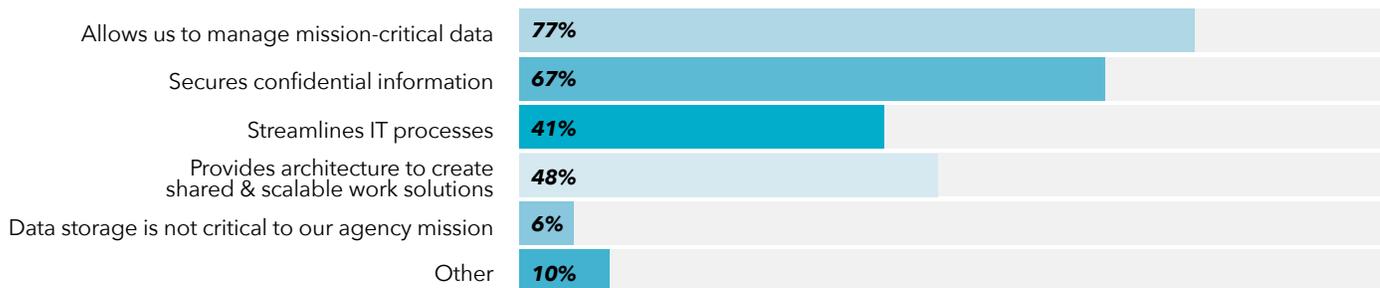
RESOURCES CONSTRAINTS ARE REDUCED

"There's always more data in the world, and we cannot continue to employ a staff that grows in direct correlation to the amount of data that we have," said Stewart. Flash storage also addresses resource constraints associated with disk-based storage. It requires less labor and time to update and it can be deployed without specialized training or expensive vendor assistance. As a result, capacity increases don't require additional manpower.

Flash-based storage also decreases concerns over physical space to house storage servers because flash stacks are physically smaller than the same amount of disk storage. Additionally, flash requires significantly less electricity to power the flash arrays and their associated cooling apparatuses. "Flash allows data centers to be in a better position to house the data that is going to be required over the course of the next decade or two," Stewart said.

"With flash storage technologies, we can reduce the power requirements to a tenth of what they cost with disk," said Stewart. "Flash storage's minimal footprint allows it to be adopted without changing the budget and, in many circumstances, eliminating the environmental costs of operating the storage, to actually make it lower than the price of the disk storage IT is purchasing today. The net result of this is it helps move budgets forward, and puts agencies in a better financial position."

how do you feel data storage supports your agency's mission? (check all that apply)



total respondents: 146

? WHY PURE STORAGE

The benefits of transitioning to flash storage are clear, but not all flash storage providers are equal. Some require more maintenance, while others can experience lags in performance during updates. Some solutions lack the robust security required by government agencies. Others come with hidden support and upgrade costs.

Pure Storage addresses each of these potential flash upgrade barriers to provide a comprehensive solution.

EXCEPTIONAL PERFORMANCE

Pure Storage's all-flash array provides the degree of performance necessary to run disparate, virtualized, and resource intensive applications. "You can get the business acceleration that you want, with that consistent sub-millisecond latency, and you deploy it across your enterprise. At the same time that you're consolidating, you need the ability to share on a single platform with multiple applications, different types of workloads, different types of tenets," said Singh.

ALWAYS ON

Pure Storage never sacrifices performance during maintenance. As agencies consolidate applications onto a single storage system, they trust that those applications will remain fully functional in any scenario. "Pure Storage is the most resilient all-flash array. It's always on, meaning you have a very resilient basket to put all of these eggs into," said Singh.

Pure Storage's architecture is unique in that, even during updates or maintenance to the system, applications continue to run and employees have access to their data at the full speed they expect.

"If an application's responsiveness slows down enough, that's effectively down time for the end users," said Singh. While many flash providers' solutions decrease in functionality during maintenance windows, this isn't the case with Pure Storage. "You'll see zero impact to performance or availability, because of the way Pure Flash is architected," said Nadeau.

"Our flash storage provides 100 percent of its performance capability under normal operations and during maintenance windows, including software upgrades, hardware expansions, and even multiple failures," explained Stewart. "During an update, you just change up the hardware. But everything stays online, performance stays optimized, and employees gain their weekends and their evenings back."



SUPERIOR DATA REDUCTION

Pure Storage helps agencies confront capacity constraints by providing the most powerful data reduction technologies in the flash industry. "On average across all workloads, we achieve a ratio of about 5.5 to 1. So for every one terabyte of raw storage that you purchase, you get 5.5 terabytes of actual, usable data that you can store," said Nadeau. "The industry average for data reduction is 2 to 1."

That degree of data reduction means Pure Storage flash arrays are on par with disk when it comes to byte per byte acquisition costs. "Add to that the reduced operation and maintenance costs, and it means we're more cost effective than disk and other flash vendors," said Nadeau.



AUTOMATED AND SERVICE-CENTRIC

Pure Storage speed, capacity, and data reduction all come without the need for expensive support.

“One of the surprises for those who get introduced to Pure Storage is how simple flash storage technology is,” said Stewart. “We have eliminated the knob turning and the tweaking and the significant amount of architectural design challenges that face data storage teams inside of data centers throughout the public sector.”

Pure Storage eliminates many of the day-to-day tasks required with conventional storage systems. This simplicity extends into ecosystem automation and orchestration via REST APIs and workflow integrations with key infrastructure partners including VMware and Microsoft. And as maintenance becomes routine and managed offsite, your IT staff can focus on higher-level job functions, such as determining new ways to advance your organization.

“We give time back to these administrators to go focus on the next set of services, the next innovation they’re going to have in their agencies, and allow them to be more important contributors to the agency,” said Stewart.

ENHANCED SECURITY

Pure Storage also increases the security of your data. Unlike many flash providers, Singh explained, Pure Storage has hardened its flash array with limited points of entry and sophisticated intrusion detection and prevention capabilities. Moreover, Pure Storage stores all data with AES-256 encryption and rapid data locking for forward deployments. As a result, transitioning data to Pure Storage’s flash arrays can actually increase your agency’s ability to safeguard information.

BUILT TO SHARE AND SCALE

Finally, while Pure Storage can secure and leverage extremely large amounts of information, agencies don’t have to commit to a solution that outstrips their needs. Instead, the company recognizes that some government organizations are not yet ready to consolidate and tackle all of their big data. “We give customers the flexibility to start small and grow completely online, both in capacity and performance, as and when their needs dictate,” said Singh.

A primary differentiator for Pure Storage is its ability to scale. Pure Storage’s flash array can scale from a single pilot to more than 1,000 users without disrupting service, significantly increasing operational costs, or requiring additional attention from your IT administrators. “What that enables customers to do is start with the right configuration without overspending upfront, and then do the upgrade as necessary,” said Singh.

What’s more, Pure Storage will provide any peripheral hardware required for a system upgrade at no additional cost.

“Our scalability approach also combines with our business model for flash,” explained Nadeau. “It gives customers the flexibility to continue to upgrade to the next generation of controllers so that they maintain the best-in-class performance... [Pure Storage] can seamlessly upgrade the controllers to a higher end controller, and that is done while maintaining data availability and full performance.” As a result, agencies don’t have to worry about the impact that new performance requirements will have on their bottom line.”

ACKNOWLEDGMENTS

about pure storage

Pure Storage, the all-flash enterprise storage company, enables the broad deployment of flash in the data center. When compared to traditional disk-centric arrays, Pure Storage all-flash enterprise arrays are 10x faster and 10x more space and power efficient at a price point that is less than performance disk per gigabyte stored. The Pure Storage FlashArray is ideal for high performance workloads, including server virtualization, desktop virtualization (VDI), database (OLTP, real-time analytics) and cloud computing. For more information, visit www.purestorage.com



ABOUT GOVLOOP

GovLoop's mission is to "connect government to improve government." We aim to inspire public sector professionals by serving as the knowledge network for government. GovLoop connects more than 150,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C. with a team of dedicated professionals who share a commitment to connect and improve government.

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