JANUARY 2024

How the Right Storage Plays a Role in Optimizing Database Environments

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Abstract: Today's organizations need a simple yet high-performance storage infrastructure to optimize the database usage experience. The right storage will have a direct, positive effect on driving better business operations, eliminating bottlenecks, and ultimately promoting the growth of the business. Pure Storage is delivering differentiated innovation in this space to help organizations achieve those goals.

Introduction

An organization's application environment fuels its business success in many ways, including by bolstering customer engagement and accelerating the pace of innovation. But operational efficiency must be behind all that. Consider some of the most important digital transformation initiatives this year, which center on becoming more operationally efficient (cited by 54% of survey respondents), developing new data-centric products (cited by 47%), and creating a more differentiated customer experience (cited by 45%).[1] Achieving those objectives requires excellent database performance and functionality.

At a time when many companies are seeing explosive data growth generated by digital transformation, they need to properly store, manage, and analyze those increasing volumes of data if they want to derive meaningful insights, make informed decisions, and reduce the burden on developers and workload administrators.

Prioritizing simplicity and optimizing the application "experience" is important, but it will affect architecture and deployment decisions spanning both on- and off-premises environments. There's a lot at stake. Fortunately, Pure Storage has technology that can help ensure success: Pure's storage solutions for databases, such as FlashArray, simplify management, reduce risk, lower TCO, and enhance performance (including faster backups and restores).

Digital Business Leaders Are Prioritizing the Application Experience

Research by TechTarget's Enterprise Strategy Group highlights the importance of optimizing the application experience of database environments. And it appears that senior IT decision-makers also realize how important application optimization is. When asked about areas of top IT investment within their organizations, 32% of these decision makers cited improving the customer experience, 30% cited improving data analytics for real time intelligence, and 29% cited increasing automation for business workflows. Applications have an impact on all of these areas.[2]

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[1] Source: Enterprise Strategy Group Research Report, *2023 Technology Spending Intentions Survey*, November 2022.
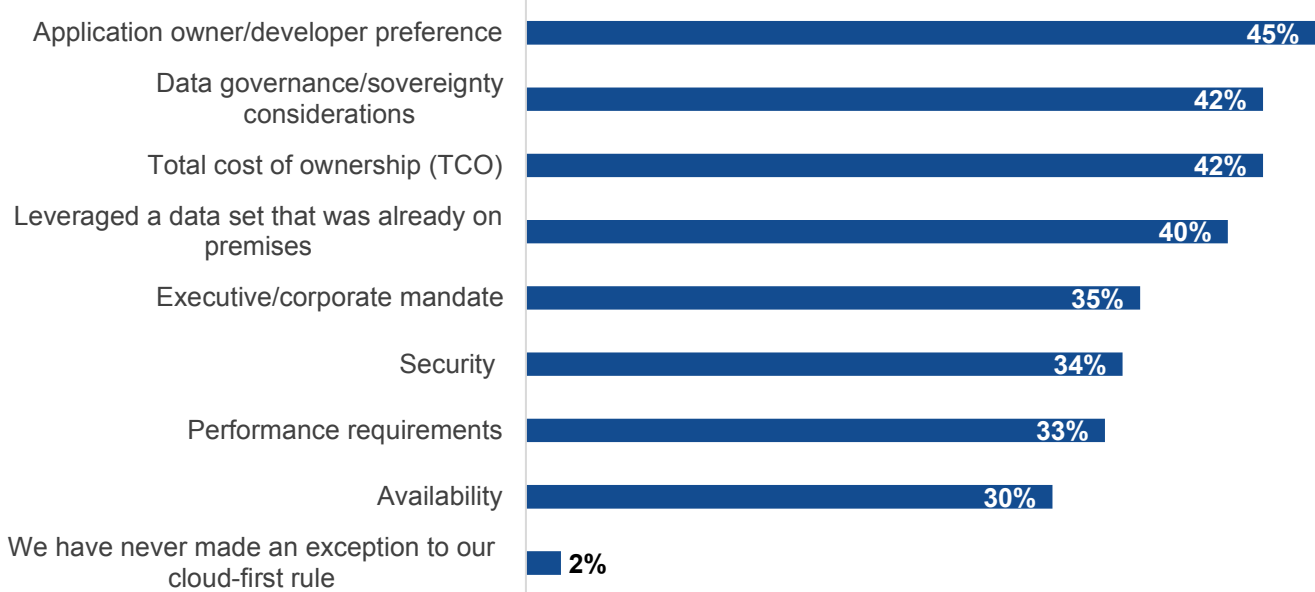
[2] Ibid.

In terms of application architecture decision-making, 82% of respondents reported that they are struggling to properly size workloads for an optimal infrastructure environment (on and off premises). They have to take into account many factors when deciding which applications should be deployed on premises versus offsite (see Figure 1).[3] Digital transformation initiatives are having a profound impact on on-premises environments, which now mimic public clouds to such an extent that the decision to deploy an app on public cloud infrastructure is not always automatic.

For example, when an application is deemed not to be a candidate for cloud storage, it is often because performance requirements can be achieved more cost effectively on premises than in the public cloud. The increased relative cost of performance in cloud storage is likely a reason why 23% of organizations identify that their database workloads are not candidates for cloud migration.[4] Additionally, on-premises infrastructures have evolved to deliver far better scalability, and on-premises delivery models have become more cloud-like in regard to providing as-a-service flexibility.

Figure 1. Why Developers/Application Owners Deploy New Applications on Premises

You indicated your organization has a cloud-first application deployment strategy. Have any of the following factors created an exception that led your company to deploy a net-new application on-premises? (Percent of respondents, N=165, multiple responses accepted)

Application owner/developer preference	45%
Data governance/sovereignty considerations	42%
Total cost of ownership (TCO)	42%
Leveraged a data set that was already on premises	40%
Executive/corporate mandate	35%
Security	34%
Performance requirements	33%
Availability	30%
We have never made an exception to our cloud-first rule	2%

Source: Enterprise Strategy Group, a division of TechTarget, Inc.

The on-premises versus off-premises deployment question is particularly applicable to database workloads. They are the backbone of many business-critical operations, and they play a huge role in delivering business insights. Application teams therefore need the best, most consistent application performance along with deployment simplicity to reduce operational risks.

The simplicity issue is especially pertinent right now, as the majority of respondents surveyed by Enterprise Strategy Group (76%) report that they have taken on added or new responsibilities to support their

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[3] Enterprise Strategy Group Research Report, *Multi-cloud Application Deployment and Delivery Decision Making*, June 2023.
[4] Ibid.

organization's digital transformation goals/initiatives (or are under pressure to do so).[5] They are similarly under pressure to accelerate operations, and the most common approach they are taking involves increasing adoption of IT automation tools (cited by 46%).[6]

Modernize Database Infrastructure With Pure Storage FlashArray

The Pure Storage FlashArray would offer numerous benefits to the database environments of these organizations. It is an all-flash array that leverages Pure DirectFlash Modules to deliver improved performance and storage density beyond what traditional solid-state disk can provide. It is notable for its simplicity-related attributes, including single-pane-of-glass, AI-driven management and REST API automation to free storage administrators from time-consuming tasks. It offers nondisruptive updates, upgrades, capacity expansions, and integrated and predictive support to ensure no business disruption and to reduce strain on administrators. Pure Storage APIs can also be integrated into broader workflow automation tools and orchestration systems.

Data consumers, app owners, and developers can acquire and relinquish their own storage resources using a cloud-like self-service model, leveraging the storage templates defined by admins. Pure offers the ability to provision Storage-as-Code, which enables developers and users to rapidly consume storage and data services (such as replication) through APIs or user interfaces, without waiting for IT.

At a real-world level, these simplicity and automation features help IT admins and users, app owners, and developers to drive business operations, eliminate bottlenecks, and achieve business growth.

Validating the Benefits of Pure Storage FlashArray for IT Operations and Database Environments

In a study of Pure Storage FlashArray users, Enterprise Strategy Group asked the respondents to project how much additional personnel time would be required if they were to replace their Pure FlashArray with an alternative storage solution. Their estimated average (mean) response translated to a 77% increase in personnel time needed.[7]

In other words, if two storage administrators are currently required to manage the environment, then switching to a different storage solution would require the organization to add one and a half additional administrators. Based on that research finding, it seems clear that the Pure Storage FlashArray is considerably easier to manage than the average storage array is.

Database Workloads: Validating the Benefits of Pure Storage FlashArray in Oracle and SQL Environments

Looking beyond productivity-related benefits, Enterprise Strategy Group also technically validated the Pure Storage FlashArray//XL to determine how it supports mixed workloads (including database workloads) without compromising performance.

Oracle

For Oracle database environments, Enterprise Strategy Group identified several improvements that organizations implementing this storage solution should see, including:

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[5] Enterprise Strategy Group Research Report, *Data Infrastructure Trends*, November 2021.

[6] Enterprise Strategy Group Complete Survey Results, *Distributed Cloud Series: Application Infrastructure Modernization Trends*, March 2022.

[7] Enterprise Strategy Group Research Insights, *Quantifying the Value That Pure FlashArray Provides to Operational Efficiency*, September 2023.

- **Lower and more predictable latency.** Pure Storage FlashArray customers reported performance improvements of 5-10x or even more after migrating to FlashArray. They noted lower latency for transactional database operations; faster load, copy, and restore times; and faster execution of business intelligence (BI) scripts.

- **Improved consolidation of Oracle workloads.** Enterprise Strategy Group confirmed that a single FlashArray can deliver at least 3-5x greater throughput for transactional and BI workloads per system, which enables IT to increase consolidation of the workloads without negatively impacting performance.

- **Reduction in Oracle licensing costs.** FlashArray can help reduce Oracle licensing costs tied to advanced compression by using Pure's own built-in space efficiency features without impacting the performance of the database or application. This move saves more than $11,000 in licensing and support for every processor. (One FlashArray customer reported an overall data reduction of 5.2:1 for their organization's Oracle database environment.) In addition, by not having to leverage processors to perform compression, more licensed cores are free to contribute to other Oracle functions.

SQL Server

For SQL Server environments, Enterprise Strategy Group leveraged information collected from vendor-provided material, public and industry knowledge of economics and technologies, and customer interviews to create a three-year TCO model of the expected costs and benefits of providing storage for hybrid cloud SQL Server operations.

This model predicted that the Pure Storage FlashArray solution can:

- Lower the total cost of storage-related operations for SQL Server deployments by 74% compared with managing and maintaining multiple traditional flash storage arrays from other vendors.[8]

- Reduce the total cost of storage-related operations by up to 53% versus using alternative purpose-built all-flash storage arrays.[9]

Together, FlashArray and Fusion can unify a dispersed storage environment by optimizing storage pools on the fly and by extending the simplicity of a cloud operating model everywhere. Additional identified benefits of using FlashArray for Oracle and SQL Server environments include:

- API integrations and automation through Windows Admin Center and SQL Server Management Studio, which eliminates the need to switch interfaces and reduces operational overhead.

- Up to 72% lower cost of hardware/software acquisition because the FlashArray solution requires far less physical hardware to meet capacity and performance requirements, thanks to its proven advantages in data reduction and predictable and low latency (provided by the all-NVMe design).[10]

- Up to 91% reduction in operating expenses through significantly lower power, cooling, and floorspace requirements.[11]

- Up to 91% lower administration cost thanks to significant time reductions in installing new hardware; reductions in the number of storage-related trouble tickets and time needed to remediate them; and

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[8] Source: Enterprise Strategy Group Economic Validation, *Analyzing the Economic Benefits of Consolidating SQL Server Workloads on Pure Storage FlashArray*, November 2022.
[9] Ibid.
[10] Ibid.
[11] Ibid.

significantly less time needed to monitor and predict capacity, optimize performance to suit applications, protect data, manage security, ensure compliance, and oversee user/system storage access.[12]

- Up to 89% lower cost of storage-related operations for SQL Server administrators. By being able to perform storage-related functions by themselves from within Microsoft using familiar SQL Server tools, SQL Server database administrators can cut down on the time they spend performing activities that are dependent on storage functions. These efficiency improvements include faster installation and provisioning of new databases, faster updates and database maintenance, less time spent tuning and balancing storage for performance or availability, and quicker completion of backups and restores of database instances.[13]

- Up to 97% acceleration in native Oracle RMAN backup and restore times and reduced backup storage costs by leveraging FlashArray//C, FlashBlades, and Cloud Block Store as targets.[14]

Conclusion

Businesses need to ensure they are optimizing their storage for their database environments. Of course, every transactional environment is unique, but at this point all of them are digitized at a long-time, advanced level. All need to embody simplicity through reduced management complexity, high performance and efficiency, and attributes that serve to reduce business risk while producing important business insights.

The Pure Storage strategy is to meet all of those requirements as fully as possible through the storage itself. Pure focuses on simplicity, performance, economics, and integration with key database applications to streamline operations, as Enterprise Storage Group has been able to validate conclusively.

The bottom line is that organizations leveraging Pure Storage for their database workloads will get more valuable database integration capabilities and other features that will enhance the databases and essentially "uplevel" them above what traditional arrays can offer.

Optimizing a database environment with FlashArray has positive cost-related effects, but that is not the end of the story. Taking this step also will give an organization scalability advantages, operational simplicity benefits, and, ultimately, plenty of real-world, business-level benefits as well.

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[12] Ibid.
[13] Ibid.
[14] Source: Enterprise Strategy Group Economic Validation, *Analyzing the Economic Benefits of Consolidating Oracle Workloads on Pure Storage FlashArray*, December 2022.

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