Economic Validation

Analyzing the Economic Benefits of Consolidating Oracle Workloads on Pure Storage FlashArray
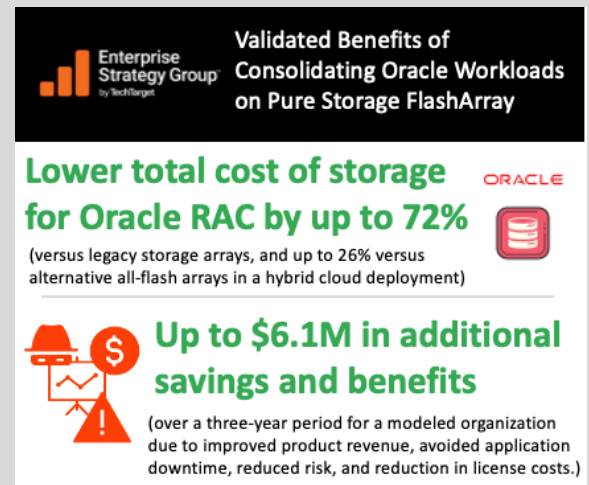
By Aviv Kaufmann, Principal Validation Analyst
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Executive Summary

Organizations are struggling with the complexity of providing low latency and highly available storage operations for on-premises Oracle applications and databases while transitioning toward a hybrid cloud strategy that supports modern cloud-native application development and delivery.

TechTarget's Enterprise Strategy Group (ESG) validated the benefits that customers have realized by consolidating workloads running on aging storage systems and appliances onto Pure Storage FlashArray. We found that customers have significantly improved Oracle workload performance, reduced complexity and risk, improved operational efficiency, and improved flexibility and agility for business operations.

Enterprise Strategy Group
by TechTarget

Validated Benefits of Consolidating Oracle Workloads on Pure Storage FlashArray

Lower total cost of storage for Oracle RAC by up to 72%
ORACLE

(versus legacy storage arrays, and up to 26% versus alternative all-flash arrays in a hybrid cloud deployment)

Up to $6.1M in additional savings and benefits

(over a three-year period for a modeled organization due to improved product revenue, avoided application downtime, reduced risk, and reduction in license costs.)

Our three-year modeled scenario predicts that Pure Storage FlashArray can provide a total cost of storage operations for hybrid cloud Oracle deployments that is 26% to 72% lower than refreshing inefficient legacy storage deployments or consolidating workloads onto alternative high performance NVMe all-flash storage offerings. In addition, our models predict up to $6.1M in additional savings and benefits resulting from increased revenue through improved development and testing efficiencies, reduced risk of application downtime, reduced risk of ransomware, and Oracle license cost savings.

Introduction

This Economic Validation focused on the quantitative and qualitative benefits organizations can expect by consolidating and modernizing storage operations supporting Oracle deployments with Pure Storage FlashArray.

Challenges

Today's modern organizations are more data-driven than ever, relying on data that is constantly generated from functions and locations across the organization, as well as from outside of it. Data is vital to organizations, whether it is used to provide insight to guide business decisions and improve operations, to better understand customers and competitors, or to power revenue-generating products, such as applications, information, or services. Our research shows that, in just two years, the number of organizations that expect to develop new data-centric products and services has increased from 52% to 70%.[1]

Oracle solutions are used by nearly all of the Fortune 100 companies for nearly every application and database need, including enterprise resource planning (ERP), supply-chain management (SCM), human capital management (HCM), and Oracle E-business suite applications. These organizations have made significant investments in their data centers to support Oracle technologies, including hardware, licenses, management certifications, and development capabilities. But both cost and complexity continue to rise for these organizations at a time when budgets are under heavy scrutiny and heavy capital expenses must be avoided. Organizations are being asked to support their legacy on-premises workloads and, at the same time, are looking to modernize by leveraging containers and services provided by public clouds.
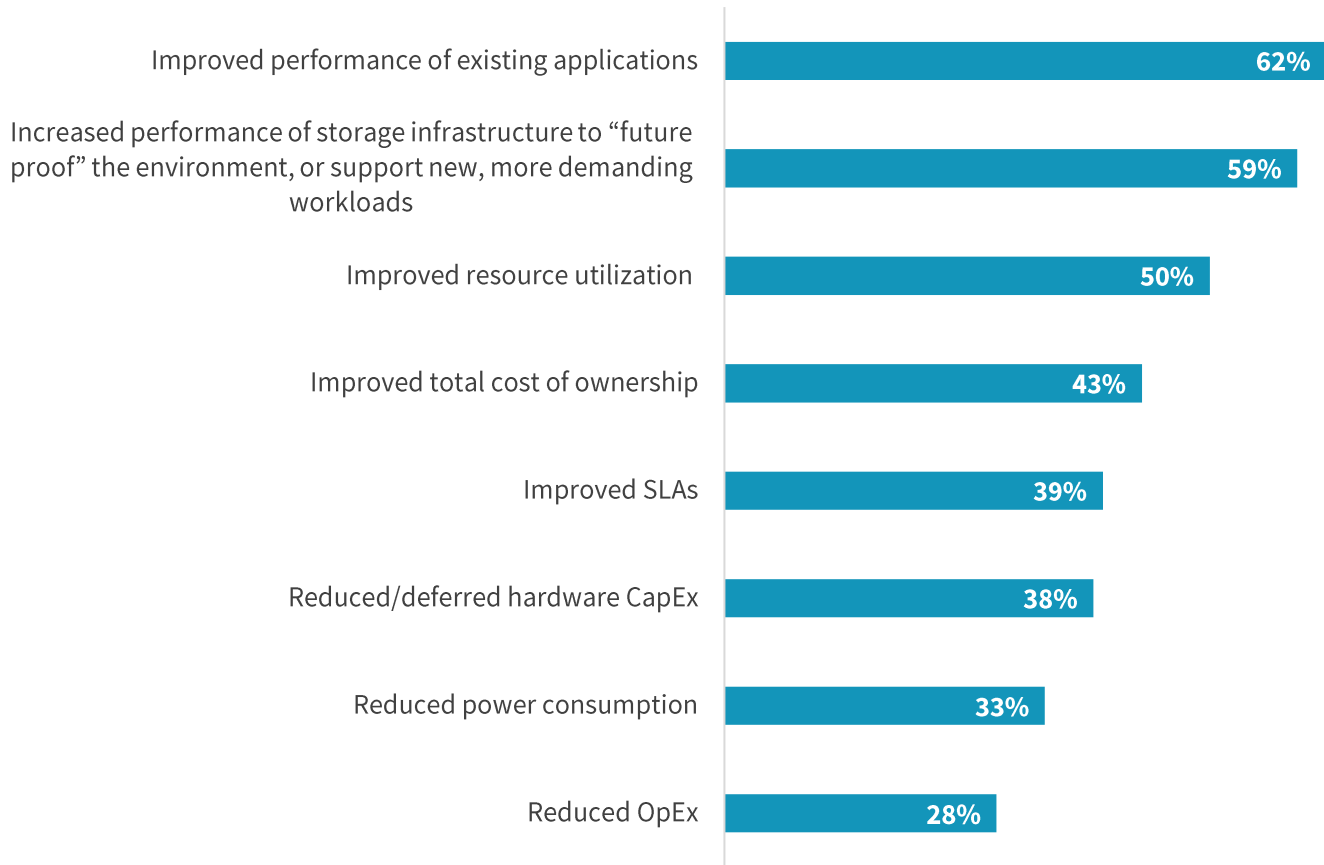
Storage consolidation is the first step, but business and mission-critical Oracle workloads demand the highest levels of performance, availability, and security. Storage admins have struggled to consolidate and provide secure and highly available storage on-premises while continuing to meet the modern demands for cloud-like agility/flexibility and delivering the predictable, low latency I/O performance demanded by Oracle workloads. An NVMe-based flash storage array can help with Oracle storage consolidation efforts. Enterprise Strategy Group (ESG) research shows that NVMe-based flash storage technology has helped to improve the performance of existing applications and better meet the demand for new and more demanding workloads, while also improving resource utilization, total cost of ownership, SLAs, hardware CapEx, power consumption, and OpEx (see Figure 1).[2]

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[1] Source: Enterprise Strategy Group Research Report, *The Evolution of Intelligent Data Management*, January 2022. All Enterprise Strategy Group research references and charts in this economic validation are from this research report unless otherwise noted.
[2] Source: Enterprise Strategy Group Research Report, *Data Infrastructure Trends*, November 2021.

Figure 1. Realized Benefits of NVMe Flash Storage

Which of the following benefits has your organization realized as the result of deploying on-premises NVMe-based flash storage technology? (Percent of respondents, N=119, multiple responses accepted)

Benefit	Percent
Improved performance of existing applications	62%
Increased performance of storage infrastructure to "future proof" the environment, or support new, more demanding workloads	59%
Improved resource utilization	50%
Improved total cost of ownership	43%
Improved SLAs	39%
Reduced/deferred hardware CapEx	38%
Reduced power consumption	33%
Reduced OpEx	28%

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

While NVMe-based flash storage technology provides a great platform for workload consolidation, simply choosing a high-performance NVMe-based storage array is not enough. Organizations should consider all that a storage product and vendor have to offer in helping them to achieve their ultimate goals of supporting and scaling legacy and modern Oracle applications, reducing complexity, implementing an effective hybrid cloud strategy, reducing risk, and accelerating operations while minimizing the impact on the business.

The Solution: Pure Storage FlashArray for Oracle Workloads

The Pure Storage FlashArray is a software-defined all-flash, all-NVMe, unified block and file storage array designed to meet the current and future needs of modern corporate and enterprise organizations. FlashArray provides the following benefits:

- **Performance:** Ultra-low and predictable 150uS to 1ms latency for all applications. The self-optimized array is perfect for consolidating block (NVMe/NVMe-oF) and file (SMB/NFS) workloads with little to no performance impact.

- **High availability:** Provides 99.9999% availability with built-in business continuity and disaster recovery across product lines while continuing to meet SLAs.

- **Storage efficiency:** Highly efficient 5:1 data reduction and 10:1 total efficiency provide up to 5.5PB of effective capacity in a greatly reduced footprint.

- **Simplicity:** Single-pane-of-glass and AI-driven management with Pure1 combine with REST API automation to free storage administrators from time-consuming tasks. Non-disruptive updates, upgrades, capacity expansions, and integrated and predictive support ensure no business disruption and reduce strain on admins.

FlashArray provides significant benefits for Oracle deployments, including:

- **API integrations and automation** through Oracle OS and VM and systems management through technology partnerships, which eliminate the need to switch interfaces and reduce operational overhead.

- **Significantly improved uptime and availability** for Oracle workloads during capacity expansion, technology updates and upgrades, and unplanned failures or disasters.

- **Reduced footprint** due to industry-leading data reduction technologies that help to lower infrastructure-related costs.

- **Efficient snapshot technology** for fast cloning of databases for database administrators and DevOps teams, as well as for reducing data protection capacity requirements and speeding recovery times.

- **Predictable, low latency performance,** allowing consolidation of mission-critical Oracle database and application workloads.

- **Accelerated native RMAN backup and restore** times by up to 97% and reduced backup storage costs by leveraging FlashArray//C, FlashBlades, and Cloud Block Store as targets.

- **Seamless hybrid-cloud deployments** enabled by Pure Storage technologies like Cloud Block Store and CloudSnap for public clouds with unified management through Pure1.

Figure 2. Pure Storage FlashArray for Oracle Workloads
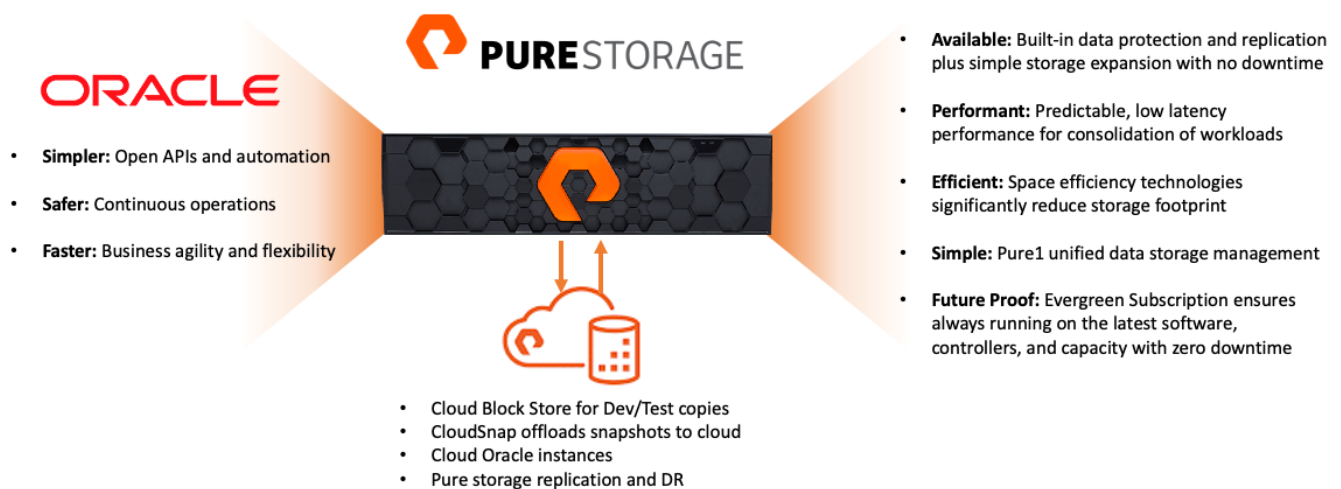
Source: Enterprise Strategy Group, a division of TechTarget, Inc.

FlashArray is available in several models:

- **FlashArray//X:** High-density, high-performance array aimed at business-critical consolidation.

- **FlashArray //XL:** Highest performance and density for mission-critical applications.

- **FlashArray //C:** Cost-effective QLC flash storage for capacity-oriented workloads.

Enterprise Strategy Group Economic Validation

The Enterprise Strategy Group (ESG) Economic Validation process is a proven method for understanding, validating, quantifying, and modeling the economic value propositions of a product or solution. The process leverages ESG's core competencies in market and industry analysis, forward-looking research, and technical/economic validation. For this validation, ESG interviewed Pure Storage customers and reviewed existing analysis and customer case studies to better understand and quantify how they have improved their storage-related operations and functions for Oracle and other database workloads since deploying FlashArray.

Pure Storage FlashArray Economic Overview

Our economic analysis revealed that, since migrating their Oracle databases and workloads to FlashArray (from traditional storage systems as well as alternative all-flash storage arrays), organizations have realized a considerable number of improvements, savings, and benefits. We found that FlashArray provided its customers with significant savings and benefits in the following categories:

- Improved Oracle Workload Performance

- Improved Efficiency and Operational Savings

- Cost Savings and Business Enablement

- Reduced Risk to the Organization

Improved Performance

Oracle DBAs and application developers struggle with slow access to data and must deliver improved end user experiences. Oracle databases require low and predictable latency for transactional workloads and high-throughput operations for BI queries and database load, copy, backup, and restore operations. When too many instances are serviced from a legacy storage array, workload contention and peformance bottlenecks can lead to missed SLAs, lost customers, and slower development.

- **Lower and more predictable latency** – Customers reported performance improvements of 5-10x or more after migrating to FlashArray, including lower latency for transactional database operations; faster load, copy, and restore times; and faster execution of BI scripts. End-to-end NVMe design helps to avoid bottlenecks and contention and minimizes latency for all front-end, controller, back-end, and disk operations. This helps to provide low and predictable latency for all consolidated workloads with no manual tuning required.

"Moving from [our previous vendor] to Pure for our tier 1 storage running high availability Oracle databases, we saw some real performance improvements, mainly in latency and capacity where we were struggling previously."

- **Improved consolidation of Oracle workloads** – Enterprise Strategy Group (ESG) validated that a single FlashArray can deliver 3-5x more or even greater throughput for transactional and BI workloads per system. Because of this, organizations were able to consolidate more database workloads, applications, and users onto each FlashArray without negatively impacting performance. Pure's always-on quality of service (QoS) helped to avoid contention and automatically tuned for the best customer experience. One customer was able to consolidate the workloads that they were previously running on nine enterprise storage arrays and appliances down to only two Pure FlashArrays, while significantly lowering latency and improving the performance of all operations. Another said, *"Literally every type of (Oracle) workload you can find in an enterprise is now running across various classes of arrays that are supplied to us through Pure. It was a great move compared to our previous storage vendor."*

- **Improved end user experience** – After moving workloads to FlashArray, storage administrators reported improved and more responsive customer experiences and a reduction in the number of performance-related tickets seen by their organization.

> *"One of the key reasons for our large migration to Pure was because when application and service owners were seeing the improvements, they were speaking about it in their peer groups, and all of a sudden, every application and service owner wanted to run their workloads on Pure."*

Improved Efficiency and Operational Savings

Providing enterprise storage for large Oracle deployments requires teams of storage administrators to manage, maintain, and optimize the storage system, as well as Oracle DBAs to perform storage-related functions like requesting/provisioning new storage; monitoring and tuning the database for storage performance; and ensuring data protection, security, and compliance. Simplified storage operations can offer an opportunity for database administrators to spend less time waiting on storage resources and more of their time managing complexity around other areas required to operate their Oracle database workloads and applications.

- **Significantly reduced footprint:** – Organizations that we spoke with were able to significantly reduce their storage footprint by consolidating workloads onto Pure Storage FlashArray. Enterprise Strategy Group (ESG) has previously validated and quantified the significantly improved levels of data reduction provided by Pure through its always-on data reduction technologies. One customer reported that, after consolidating Oracle workloads onto Pure, they now enjoyed a 4x smaller data center footprint and had reduced power and cooling costs by 74%. Another customer reduced the number of storage rack units (RU) required from 236 down to 63 and reduced power consumption by 60%. This reduction in footprint also leads to lower administration and maintenance costs since organizations don't have to manage and maintain the additional racks of storage, networking, and appliances.

- **Simplified management experience** – Customers were able to use the built-in automation and AI-driven insight of Pure1 to manage all Pure storage arrays across locations and even in the cloud from a single pane of glass. They reported greatly reducing the amount of time spent

> *"With Pure, we reduced and consolidated our data center footprint from 236RU [previous vendor] down to 63RU, which contributed not only to a 60% savings in power consumption on the Arrays, but also in HVAC costs, as well."*

managing and maintaining their storage, allowing them to focus on other business initiatives. Others reported the ability to use Pure's REST API to automate repetitive tasks and better integrate operations with other services and workflows.

- **Integration with Oracle and OracleDB** – Pure tightly integrates with Oracle OS, VM, and Oracle Enterprise Manager through technology partnerships. Pure customers reported that they were easily able to initiate storage operations for storage provisioning and management of development copies and backup operations from within Oracle VMs and from within the Oracle Enterprise Manager (OEM). Customers saved valuable time not having to coordinate with remote teams or open storage tickets for the storage administrators to handle operations. Teams reported that they were able to leverage their existing Oracle skills and training and didn't have to hire specialists or acquire new management training and certifications.

- **Improved visibility and reporting** – Customers reported spending less time collecting and consolidating information across management interfaces to provide reports on system status, capacity planning, and performance of workloads. All of this information was available to them whenever and wherever needed in the Pure1 interface.

Cost Savings and Business Enablement

Pure FlashArray provides cost savings through all-inclusive arrays, software, and Evergreen subscriptions. It also enables the business to achieve transformation and modernization goals faster:

"We use Pure1 on a daily basis for forecasting, reporting, real-time system performance, support cases, and purity upgrades. It works great, and it has helped us a lot."

- **All-inclusive array and management software** – Pure1 and Purity lower the cost of licenses for multiple software products and appliances. There is no additional cost to enable technology feature support or software functionality. Technologies like ActiveCluster and ActiveDR are included in the software subscription at no cost. They compress traffic, eliminating the need for replication appliances or software and greatly lowering the cost and complexity of DR.

- **Reduction in Oracle licensing costs:** Customers can help reduce Oracle licensing costs paid for advanced compression by using Pure's built-in space efficiency features without impacting the performance of the database or application. This saves over $11K for every processor paid in licensing and support. One customer reports an overall data reduction of 5.2:1 for their Oracle database environment. In addition, by not having to leverage server processors to perform compression, more licensed cores are free to contribute to other Oracle functions. These cores essentially "recoup" the value already paid by the organization for expensive Oracle EE licensing.

- **All-inclusive array and management software** – Evergreen//One and Evergreen//Flex pay-as-you-go storage subscriptions give financial flexibility of choice and eliminate the need to manage storage and/or reduce the effort required to plan for capacity and technology upgrades.

- **Guaranteed innovation** – With a Pure Evergreen//Forever subscription, organizations can take advantage of the latest improvements in hardware technology over time, without having to research, plan, or purchase new storage arrays. Customer deployments are upgraded in place with forklift upgrades and without disruption to

service every three years as new technology is made available, providing improved performance and scalability for their workloads.

- **Hybrid-cloud agility and flexibility** – With Cloud Block Store and CloudSnap, organizations can leverage the cloud operating model and provide self-service storage consumption on demand. Customers are able to run workloads either in on-premises Oracle instances or in public cloud deployments and provide up-to-date dev/test instances to remote workers. The Purity operating environment provides seamless storage services, and the entire hybrid environment can be managed from within a single Pure1 window. This provides storage teams the agility and flexibility to quickly meet the needs of business operations today and then balance and optimize operations when the time was right.

- **Faster path to modernization** – Containerization of Oracle databases is a key consideration for many organizations going forward, as developers develop modern cloud-native applications or re-platform legacy Oracle applications into containerized microservices. Pure ensures the availability, visibility, and performance required for successful containerization both on-premises and in the cloud. Portworx by Pure Storage is a data management platform that makes the management and mobility of Kubernetes containers containing Oracle workloads much simpler, which allows organizations to provide highly available, scalable, and high-performance data services for Kubernetes containers.

Reduced Risk

Downtime and service interruptions of Oracle-based applications have an immediate negative effect on revenue, productivity, customer satisfaction, and functionality of operations. Storage admins must ensure the highest levels of data availability, compliance, recoverability, and protection against threats.

- **Reduced risk of downtime** – Customers reported a significant reduction in impact on business operations since switching to Pure. Most customers reported that they had not realized a single downtime event since migrating to FlashArray, and those that did explained that the downtime was planned and meant to accommodate workflows. Before Pure, these organizations had reported periodic downtime for updates and upgrades. The Pure1 Meta platform avoided issues for organizations by leveraging AI-driven analytics to predict and remediate issues before they happened.

"We were exceeding our RPO for our main Oracle database of a 24-hour backup window, and with Pure Snapshot, we brought that down to 30 minutes (RTOs and RPOs), which was very significant. It really did bring us back within our own risk tolerance for sure."

- **Improved local and remote DR recovery** – Pure ActiveCluster provided active-active synchronous replication with automatic zero RPO and zero RTO failovers for stretched clusters. ActiveDR provided a remote DR solution that greatly lowered RPO and simplified the operation of failover down to a single click for organizations (both ActiveCluster and ActiveDR are included with no additional cost). The same Purity/FA software is run both on-premises and in public clouds, providing high performance and highly available storage in the cloud with the same operational and efficiency benefits that users see on-premises. Pure has also supplied customers with a reference architecture for designing high availability hybrid-cloud storage services for Oracle application and database deployments.

- **Improved security and ransomware protection** – Customers reported that Pure offered them improved security with encryption of data to better meet regulations. They were able to use Pure SafeMode snapshots to cost-

effectively protect against ransomware events and unintentional deletion and remediate events that did happen quickly, without impact to operations. *"Pure's encryption at rest and SafeMode snapshots gives us ransomware protection and allows us to conform to regulatory requirements and mainly protects our most valuable asset, which is our data, which is something we didn't have before with our previous vendor,"* reported a customer we interviewed. Some customers reported that having immutable SafeMode snapshots helped to lower their cost of cyber-insurance premiums.

- **Improved copy and restore times and faster time to dev/test innovation** – Customers reported that they were able to deliver business copies of databases to testers and developers much quicker than they had before, allowing them to provide up-to-date copies that were refreshed several times per day instead of on a weekly basis. This is of critical importance to developers of Oracle applications and helps to speed innovation of new technologies, features, and revenue streams. One customer that migrated Oracle applications and workloads onto Pure Storage FlashArrays reported that Oracle DBAs were able to reduce native RMAN backup times by 97% and reduce recovery times by 98%.

"A full Oracle database restore of our most important data used to take 30 hours. Now with Pure Storage, it went to 38 minutes. It's such a massive difference that we couldn't believe it. We ran the tests several times to make sure those numbers were real."
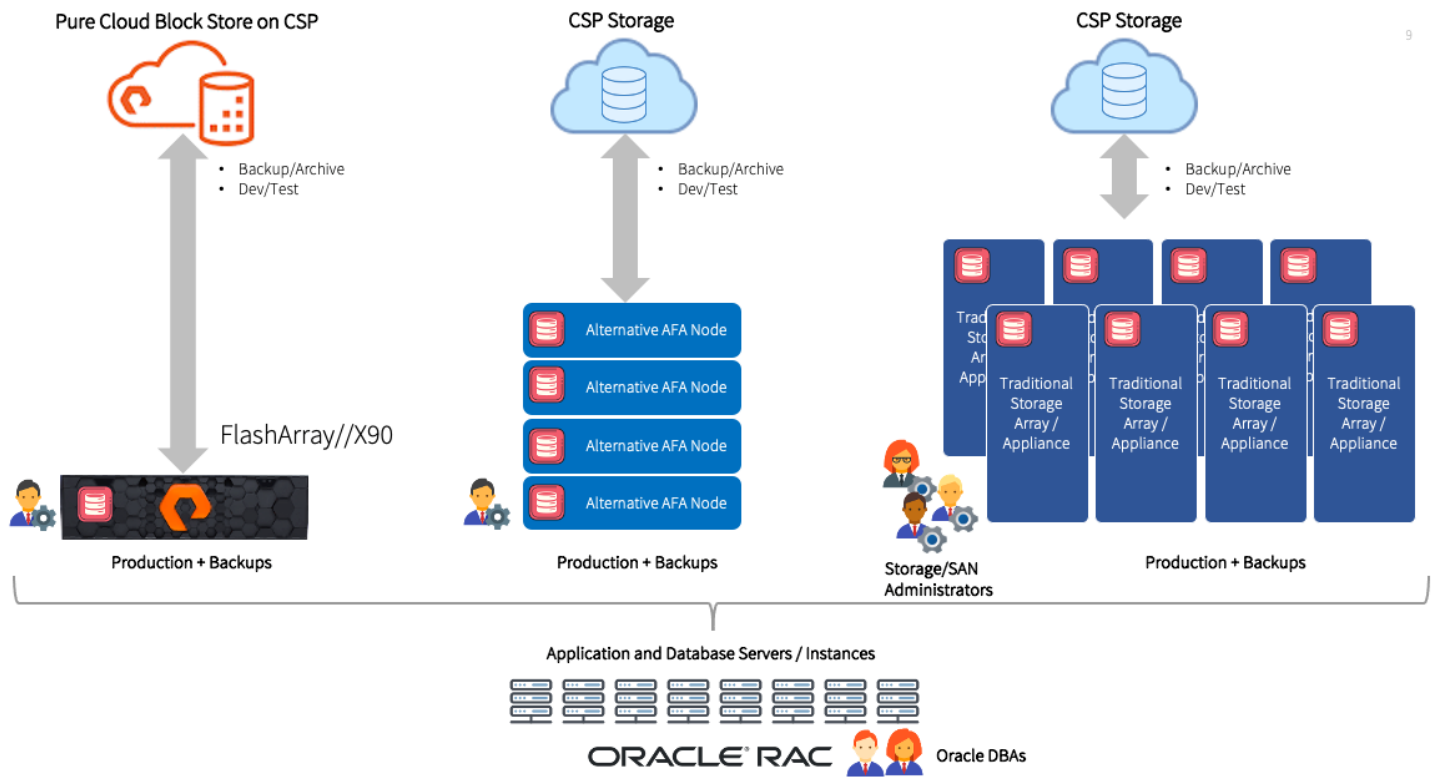
Enterprise Strategy Group Analysis

Enterprise Strategy Group (ESG) leveraged the information collected through vendor-provided material, public and industry knowledge of economics and technologies, and the results of customer interviews to create a TCO model that analyzes the expected costs and benefits of providing storage for a hybrid cloud Oracle database and applications over a three-year period. ESG's interviews with customers who have recently made the transition, combined with experience and expertise in economic modeling and technical validation of storage technologies from Pure Storage and alternative offerings, helped to form the basis for our modeled scenario.

Our modeled deployment assumed an organization was looking to provide high-performance storage for Oracle databases and a total of 160 application instances with an initial average of 1.5TB of storage associated with each instance and a modest 10% annual growth in average storage demand. In addition, we assumed that for every GiB of effective production storage capacity, a total of 9.2 GiB of additional effective data for backups, snapshots, and dev/test copies was stored on local storage arrays. In addition, we assumed that a total of 200TiB of effective cloud storage capacity was required for cloud application instances, cloud backups/archive, and dev/test instances.

ESG then modeled the expected costs across three scenarios. The baseline case considered refreshing the current storage environment, consisting of eight traditional scale-up storage arrays (populated with flash storage devices) and several appliances (replication and cloud gateway). We then sized and configured an alternative scale-out flash offering that could consolidate the storage into a singularly managed environment across several nodes of high-performance all-flash storage. And finally, we considered consolidating the storage requirements into a single Pure Storage FlashArray//X90. The results of publicly available Oracle SLOB testing for reference architectures were used to ensure that the three offerings could deliver near equivalent IOPS in aggregate. In addition, we calculated the expected costs to deliver the required capacity of cloud-based storage on the same cloud service provider (CSP) with (for Pure) and without (for the alternatives) the added cost and benefits of using Pure Storage Cloud Block Store and managing data with Pure1. A visual comparison of the three scenarios is shown in Figure 3.

Figure 3. ESG Modeled Scenario Overview

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

Our models predicted that the Pure Storage FlashArray solution could lower the expected total cost of storage-related operations for the Oracle deployments by 72% compared with managing and maintaining multiple arrays with flash storage from traditional storage vendors and by up to 26% compared with alternative purpose-built all-flash storage arrays. The results are shown in Figure 4.

Figure 4. Results of ESG's Three-year Modeled Scenario
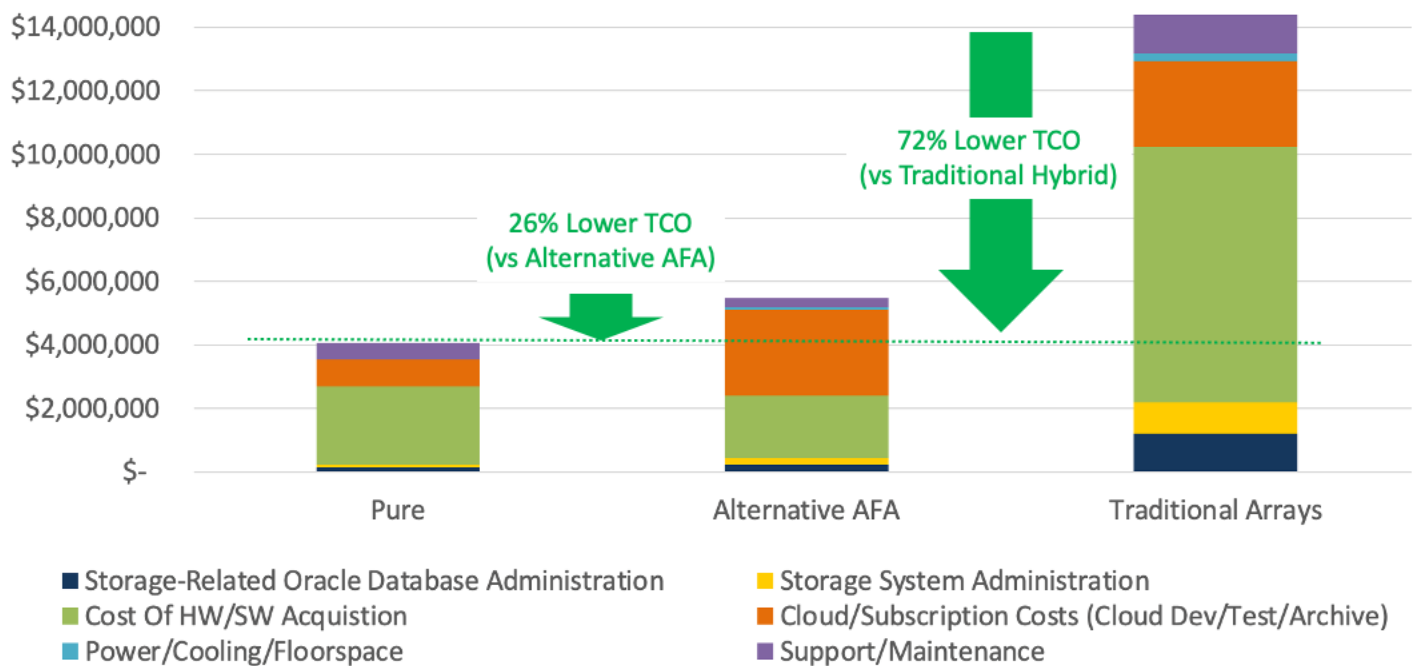
Source: Enterprise Strategy Group, a division of TechTarget, Inc.

What the Numbers Mean

- **Up to 69% lower cost of HW/SW acquisition:** The FlashArray solution required far less physical hardware to meet the capacity and performance requirements due to proven advantages in data reduction capabilities and predictable and low latency provided by the all-NVMe design. In addition, the base software cost included all features and functionality, while traditional solutions required additional licensing or appliances to handle features such as synchronous replication and cloud connectivity. Finally, an Evergreen//Forever subscription kept upfront costs low, while any required annual capacity upgrades were simple and non-disruptive.

- **Up to 95% reduction in operating expenses:** The 3U FlashArray solution significantly lowered expected power, cooling, and floorspace costs compared with the 22U alternative AFA solution and the eight racks of hardware required by the traditional scale-up solutions.

- **Up to 57% lower cost of support and maintenance:** The initial three years of support and maintenance contracts paid to vendors were lower for Pure. These costs can vary between vendors and can increase drastically after three years but are generally proportional to the cost of HW and SW acquisition. The cost of a Pure Evergreen//Forever subscription is predictable, does not rise after three years, and can include upgraded technology.

- **Up to 91% lower cost of storage system administration:** Our models assumed an existing two-person storage administration team was responsible for managing and maintaining the hybrid storage environment on-premises and in the cloud. Our models predicted that the FlashArray and Cloud Block Store managed with Pure1 could provide a significant reduction in the time to deploy/install new hardware; provide a reduction in both the number of storage-related tickets and time to remediate them; require significantly less time to monitor and predict capacity; optimize performance for applications; perform data protection operations; and manage security, compliance, and user/system access to storage.

- **Up to 89% lower cost of storage-related operations for Oracle database and application administrators:** By leveraging the many benefits of Pure and being able to perform storage-related functions by themselves from within the Oracle tools they used every day (Oracle VMs and OEM), Oracle DBAs would be able to reduce the time they spent performing activities that were dependent on storage functions. This includes faster installation and provisioning of new databases, faster updates and database maintenance, less time spent tuning and balancing for performance or availability, and quicker completion of backups and restores of database instances.

- **Up to 69% lower cloud-storage related costs:** For the 200TiB of cloud storage, we leveraged a publicly available calculator to compare the expected pricing of Pure Cloud Block Store versus the native CSP performance tier of storage over a three-year period. This includes costs paid to Pure Storage and to the cloud service provider. Even when compared to the more cost-effective storage tier, Cloud Block Store provided 48% savings over three years. These savings are made possible by leveraging Pure's data reduction technologies to help reduce costs.

Additional Savings and Benefits

In addition to the expected lower total cost of ownership, Enterprise Strategy Group (ESG) modeled five potential areas in which the Pure Storage deployment could provide additional savings and benefits to the organization based on lowering Oracle licensing costs and increasing the value of these licenses, positively impacting Oracle-related application development operations and production Oracle application and database deployments, and protecting against ransomware events. While the quantification of these examples may not be relevant to every organization, and actual impact is highly dependent on the organization, these examples help to illustrate the areas that should be considered by every organization.

- **Avoided cost of Oracle Advanced Compression licenses:** By using the data reduction technologies built into every Pure Storage offering, organizations can avoid costly licenses for Oracle Advanced Compression while enjoying the same or better space savings both on-premises and in the cloud. ESG assumed a total of 320 processors and an Oracle Core Factor of 0.5 for a total of 160 licensed processors. By not having to purchase Oracle Advanced Compression licenses at a cost of $11,500 per license and pay roughly $2,500 for updates and support per license, the modeled organization could save over $2.2M.

- **Reclaimed value of Oracle EE Processor licenses:** Advanced Compression and other storage features require server processing power to perform heavy calculations. This overhead has been estimated by Oracle to consume roughly 3% to 5% of available processing power, and while it seems trivial, freeing up this additional processing power for use by already paid-for Oracle EE licenses can return substantial investment back to the organization. We assumed that each of the 160 processors was provided an Oracle EE license at a cost of $47,500 plus $10,450 for updates and support. At a total licensing cost of $9.272M, avoiding the 5% overhead of Advanced Compression returns roughly $463K of already paid-for value back to the organization.

- **Improved Oracle-related product revenue provided by accelerated development:** The FlashArray solution positively impacts development timelines by providing faster access to and more frequently updated dev/test copies to developers working on-premises and in the cloud, fewer issues with access to databases, faster rollback to earlier database views, and a quicker path to microservices and containers with Portworx. ESG assumed a team of 20 developers, with each providing about $1M in annual revenue generated through new product development and incremental product improvements to existing services. Assuming a 3% increase in development productivity, each developer could potentially generate an additional $30k of annual revenue, totaling $1.8M over three years.

- **Avoided cost of downtime for production Oracle-based applications and databases:** Customers reported that FlashArray provided them significantly faster restores of production databases, reducing the time live applications were impacted per restore from 2 hours to only 15 minutes. Our model assumed that the organization's $20M in annual revenues was generated across 32 commercial instances, of which only two were impacted each year due to the need to restore the database, resulting in lost revenue until services were restored. Our models predicted that a total of $767K of potential lost revenue could be avoided over the three-year period with FlashArray.

- **Avoided impact and cost of ransomware:** Pure's SafeMode snapshots can help to safeguard against an increasing number of successful ransomware events. Using industry-published numbers for the risk of encountering a successful breach and the expected cost to remediate a ransomware event, we modeled the expected cost to remediate ransomware events. We assumed that Pure could help reduce the risk of successful ransomware attempts by up to 80%, resulting in $864K in avoided risk over a three-year period.

Figure 5. Additional Potential Savings and Benefits Provided by Pure Storage FlashArray

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

Issues to Consider

While our models are built in good faith upon conservative, credible, and validated assumptions, no single modeled scenario will ever represent every potential environment or engagement. We recommend that you perform your own analysis of your Oracle storage requirements and consult with your Pure Storage representative to understand and discuss the options and potential possibilities proven through your own proof-of-concept testing.

The Bigger Truth

Businesses have been well rewarded for the substantial investments that they have made in Oracle technologies over the years. Legacy applications provide the business a stable platform to rely on for operations, but at the same time, these businesses need to modernize and transform to be able to innovate and adjust to rapidly changing environments going forward. Legacy Oracle workloads that run on-premises require mission-critical performance and availability and are often distributed across several siloed storage arrays. Data protection and disaster recovery capabilities are provided through additional software and appliances. This results in inefficiencies, management complexity, limitations, and reduced visibility.

Public cloud vendors have made a hybrid cloud strategy easily achievable for Oracle environments, where teams can leverage their in-house investments, expertise, and processes, while modernizing operations outside the data center. But managing data operations between on-premises environments and any public cloud can be time-consuming and costly.

Enterprise Strategy Group (ESG) validated that migrating and consolidating Oracle environments onto FlashArray and using PureStorage technologies like Cloud Block Store and Pure1 resulted in greatly improved Oracle workload performance, reduced risk to the organization, a significant reduction in administrative and operational overhead, and improved business outcomes. Our three-year models predicted a 26% to 72% reduction in the expected total cost of ownership for storage, as well as millions of dollars in potential savings and benefits provided by a reduction in Oracle licensing costs, faster Oracle-related application development, less impact to commercial Oracle applications and databases, and improved protection against ransomware events.

Pure Storage has been a trusted Oracle Gold Partner since 2015 and publishes many Oracle reference architectures, which shows their dedication to the technologies. ESG believes that Pure Storage's vision is one that extends far beyond the traditional data center. FlashArray is an excellent solution to consolidate and accelerate on-premises Oracle environments, as well as for those that organizations are looking to transform toward a hybrid- or multi-cloud strategy and containers (with Pure Fusion and Portworx). Pure Storage provides investment protection with future-proof technology, allows

organizations to choose the financial model that works best for them with upfront capital or pay-as-you go (Evergreen//One) subscriptions, and provides a faster path to modernization and sustainability. If your organization is looking for a strategic partner and a storage solution designed to accelerate, protect, modernize, and simplify its Oracle environment while reducing costs and enabling positive business outcomes, ESG suggests you consider Pure Storage FlashArray.

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