PURESTORAGE®

WHITE PAPER

Real-time Enterprise File Service on the Pure Storage Platform

Delivering high performance, scalability, and security for modern data management.

Contents

Introduction

The modern IT landscape has changed dramatically. Applications have multiplied, workloads have grown more complex, and data is expanding at an exponential rate. Enterprises now manage dozens, if not hundreds, of storage arrays built on rigid, outdated architectures. Despite claims of simplification, the reality at scale remains challenging. These legacy systems force organizations into time-consuming tasks like configuring RAID groups, volumes, and aggregates, while also trying to match an application's dynamic performance needs to rigid setups that may not have adequate capacity or performance. This inflexibility stifles growth and innovation, leaving IT teams bogged down in basics instead of focusing on strategic initiatives.

Legacy enterprise storage solutions continue to face critical issues:

- **Complex management:** Routine tasks take longer, adding operational overhead and requiring extensive pre-planning for new workloads, which delays key initiatives.
- **Infrastructure inefficiencies:** Poor resource utilization leads to bottlenecks, unpredictable performance, and higher power and space consumption.
- **Lack of cyber resiliency:** Layered management increases human error and widens the attack surface, making systems more vulnerable to breaches.
- **Limited agility and SLAs:** Inflexible systems hinder upgrades and expansions, leading to disruptive transitions. Achieving cloud-like operations with guaranteed SLAs becomes unfeasible.

Outdated systems struggle to keep up with modern cyber threats. Their lack of agility makes it difficult to adapt to the constantly evolving threat landscape, leaving organizations exposed to data breaches, ransomware attacks, and compliance risks. The combination of limited scalability, high operational costs, and inadequate security poses a significant barrier to achieving the speed, reliability, and safety businesses need in today's data-centric world.

Challenges Facing Legacy File Architecture

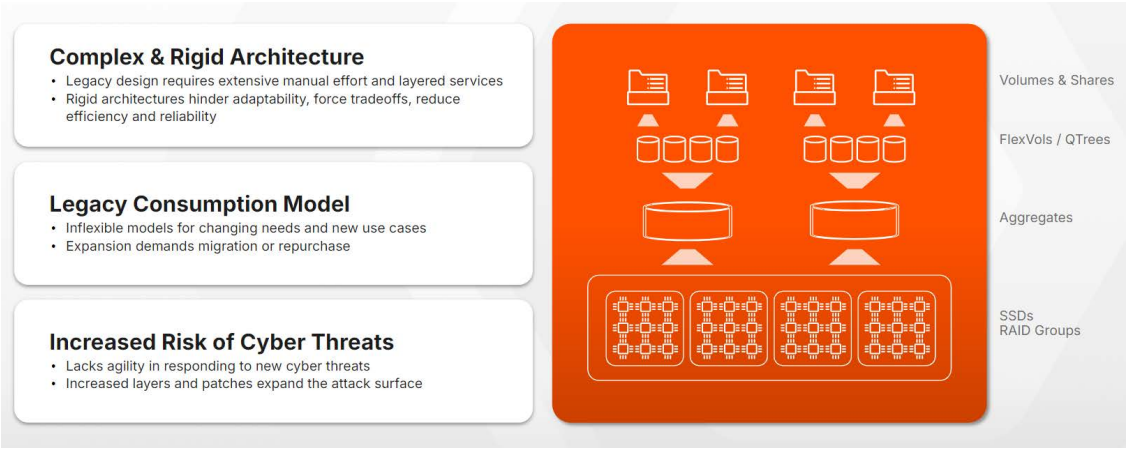

FIGURE 1 Challenges facing legacy file architecture

What Is Real-time Enterprise File Service?

Real-time Enterprise File Service provides immediate, highly available access to data, dynamically adapting and reconfiguring Pure Storage® to meet the fast-paced demands of modern applications. It leverages a robust metadata architecture that enables seamless scalability and high throughput, efficiently handling massive workloads. Unlike traditional file architectures, which are rigid and often struggle with scaling limitations or delays, Real-time Enterprise File Services simplify management, scale effortlessly, and ensure secure, continuous access to critical data.

Why Use Real-time Enterprise File Service?

Ever looked back and wished you could've made different decisions with the knowledge you have now? In today's fast-paced world of technology, change happens at lightning speed, and real-time adaptability is no longer optional—it's essential to stay ahead of the competition.

Traditionally, enterprises have invested in infrastructure to meet immediate needs. But as workloads evolve, tomorrow's demands are often unpredictable. The result? Organizations are stuck with infrastructure designed for yesterday—built for a slower, less flexible world. Legacy architectures impose difficult trade-offs, restricting your ability to adapt as business requirements shift and workloads evolve.

Executive Summary

This whitepaper explores how the Real-time Enterprise File Service, powered by the Pure Storage platform, addresses the evolving challenges of data management by consolidating all file needs within a unified platform.

As organizations face growing data demands, the need for reliable, scalable, and high-performance storage solutions has never been greater. The Real-time Enterprise File Service enables enterprises to efficiently manage and access their data, optimize performance, and reduce operational costs.

At Pure Storage, we've redefined storage simplicity with solutions built on these principles:

- **Simplicity by design:** Minimize complexity to maximize efficiency.
- **Always-on availability:** Deliver reliable performance without compromise.
- **Effortless scalability:** Grow seamlessly as needs evolve.
- **Utility-like experience:** Ensure storage works predictably, securely, and without friction.

With the Pure Storage platform, storage becomes invisible, allowing organizations to focus on innovation and achieving business goals. This paper highlights solutions that not only improve data accessibility but also support diverse workloads, from file sharing to data analytics and VDI, enabling organizations to stay agile and competitive in a fast-changing digital landscape.

Legacy File Architecture Scale Challenges	Real-time Enterprise File Solutions
✗ **Rigid & Layered Complex Architecture** Rigid architectures hinder adaptability, force tradeoffs, and reduce efficiency and reliability	✓ **Unified Architecture** Simplifies data management with unified, streamlined architecture, reducing complexity and rigidity
✗ **Complex Multi-Array Management** More arrays result in increased management and reduced consistency	✓ **Fleet Management** Manage scale by abstracting array architecture into global Storage Pools while keeping your data in-place
✗ **Tier Management** Workloads change and data ages, reducing efficiency and increasing cost	✓ **Zero Move Tiering** Intelligent data management that eliminates legacy tiering complexity to optimize performance and cost
✗ **Inconsistent Workload & Quality of Service** Workloads change and conflict with each other at scale	✓ **Always On Quality of Service** Always On Quality of Service (QoS) ensures that resources are available to all workloads
✗ **Data Access & Fragmentation** Data is duplicated and fragmented to ensure consistency of access management	✓ **Isolated File Access** Data access isolation to service multiple untrusted domains, present multiple share or export namespaces, or share between domains
✗ **Security Management** More arrays result in larger surface area and forensics from an attack	✓ **File Security Logging & AI** Security and forensics for auditing file events via ChatGPT functionality within Copilot
✗ **Delivering on SLAs & Upgrades** SLAs are hard to deliver when hardware ages, but cannot be replaced due to downtime	✓ **Performance and Capacity SLAs** Consume like the cloud with consistent performance and capacity service level agreements at scale

FIGURE 2 Comparison of legacy file architecture vs Real-Time Entreprise file architecture

Industry Insights from Gartner®

A recent Gartner report highlights the growing need for scalable, high-performance storage solutions as businesses adopt more data-driven strategies. Companies leveraging integrated platforms report substantial improvements in operational efficiency and cost savings. The Pure Storage platform, with its unified approach to file, block and object services, addresses these evolving challenges, positioning itself as the top choice for enterprises looking to optimize and future-proof their data management strategies.

For the fourth year in a row, Pure Storage has been named A Leader in the Gartner® Magic Quadrant™ for File and Object Storage Platforms. With several recent game-changing innovations, our industry-leading platform ensures businesses stay ahead with a future-ready solution.

For more details, you can access the full Gartner report here.

Audience

This whitepaper is intended for a diverse audience, including those focused on enhancing data management strategies and optimizing storage solutions. It addresses professionals involved in designing and implementing storage architectures, as well as those managing storage environments to ensure performance and reliability. Additionally, it speaks to business leaders interested in how effective data management can drive efficiency, reduce costs, and support growth initiatives. Finally, it targets technical engineers and developers who need high-performance storage solutions for unstructured data workloads.

Through this whitepaper, readers will gain insights and practical guidance on leveraging Pure Storage file services to meet the evolving needs of modern organizations.

Purpose

This whitepaper aims to provide a comprehensive overview of the Real-time Enterprise File Service powered by the Pure Storage platform, highlighting its technical advantages and value in enhancing data management efficiency, reducing costs, and improving performance. It offers practical recommendations for implementation, supports informed decision-making for stakeholders, and showcases real-world case studies to illustrate successful applications. Ultimately, this document serves as a resource for organizations looking to optimize their file management and data accessibility through the capabilities of the Pure Storage platform.

Real-time Enterprise File Service Powered by the Pure Storage Platform

The Real-time Enterprise File Service, powered by the Pure Storage platform, offers a revolutionary approach to data management, designed to meet the evolving needs of modern organizations.

The Real-time Enterprise File Service is built on the following core principles:

Simplified management:

- **Unified storage pool:** A single virtualized, limitless storage pool for mission-critical to backup use cases that are automated via APIs so that data services can provision and manage storage assets as needed
- **Consistent experience:** A common OS to deliver a consistent experience and predictable performance on-prem or in the cloud

Native agility with guaranteed SLAs:

- **Evergreen//One™—Easy, automated self-service:** Guaranteed SLAs as a service for all data storage and services will empower self service and simplify operations making data management almost invisible
- **Evergreen//Forever™—Non-disruptive future-proof infrastructure:** Always improving and all-inclusive software and periodic hardware enhancements delivered non-disruptively

Cyber resiliency:

- **Eliminating downtime and system disruptions:** No downtime should be required and software updates to occur constantly without the need for planning
- **AI-enabled optimization and automation:** Optimizing performance, maintaining uptime, enhancing data security should be handled by background AI processes, not the end user.

Infrastructure efficiency

- **Built-in Flash Efficiency:** DirectFlash™ technology from Pure Storage has a proven track record of innovation to deliver industry-leading all-flash capabilities developed for the enterprise. Achieve unmatched performance, space and economic efficiency without the limitations of traditional SSDs.

These principles work together to deliver a powerful real-time enterprise file service solution that simplifies data management, enhances security, and provides organizations with the agility they need to thrive in today's fast-moving business landscape.

The following image describes the Real-time Enterprise File Service on Pure Storage platform.

FIGURE 3 What Real-time Enterprise file solutions solves

Redefining the Standards for Enterprise-grade Agility and Simplicity

Real-time Enterprise File Service is built on the solid foundation of Pure Storage's traditional file services, which have long been recognized for their reliability and performance. As modern workloads—including AI, AR, real-time video editing and compositing (think green screen) for post-production, 5G billing, virtual desktop infrastructure (VDI), and analytics—continue to challenge legacy systems, Pure Storage has evolved its offerings to meet these demands. Traditional file storage systems often lock organizations into rigid architectures that are difficult to adapt as application requirements change, leading to complexity and inefficiency.

- **Real-time agility:** Adjust storage resources in real time without rigid, pre-configured silos or manual reconfiguration.
- **Agility across all storage resources:** Maximize storage with global pools and automated fleet-wide operations using Pure Fusion™.
- **Zero-move tiering:** Instantly deliver required performance levels without moving data between tiers.
- **Truly non-disruptive:** Perform in-place upgrades with no downtime or data migration for both hardware and software.
- **Expanded support for cost-sensitive workloads:** FlashBlade//S100 offers AI-ready storage with scalable architecture for entry-level enterprise use cases.
- **Cloud-like operations:** Automate SLA management, QoS, and multiprotocol configurations, expanding storage as needed.
- **The power of storage as a service:** Pure Storage delivers true storage-as-a-service for file with Evergreen//One, offering unmatched SLAs.

In response, Real-time Enterprise File introduces dynamic capabilities that allow file services to adapt and reconfigure in real time. This modern approach simplifies management while mitigating risks, empowering organizations to remain agile in a fast-paced digital landscape. Built on the Pure Storage platform, Real-time Enterprise File Service maintains the core strengths of previous solutions while providing enhanced functionalities that support:

- **Any workload:** From critical applications with sub millisecond response time requirements to general file sharing, our platform meets diverse storage needs.
- **Any scale:** Seamless scalability ensures that your storage solutions grow with your data demands.
- **Simple unified infrastructure:** A streamlined approach reduces complexity and enhances operational efficiency.

By leveraging the foundational strengths of traditional file services, Real-time Enterprise File Service enables organizations to harness modern capabilities without compromising on reliability or performance.

Intuitive Experience

Pure Storage design prioritizes simplicity and flexibility, modernizing data storage across products, services, upgrades, integration, and support. Real-time agility allows dynamic adjustments, while global storage pools and automated operations streamline resource management. With AI Copilot, file-related tasks are further simplified, removing IT bottlenecks.

Evergreen by Nature

Sustainable, ESG-ready solutions reduce space and power consumption, while non-disruptive upgrades ensure systems never reach end-of-life. Evergreen//One offers true storage-as-a-service with comprehensive SLAs that enhance operational efficiency. Our DirectFlash Modules (DFMs), available in 150TiB and 75TiB sizes, eliminate the need for SSD vendor translation layers, maximizing performance and efficiency.

This unique capacity significantly lowers power, space, and cooling costs, offering a competitive edge in the industry. Reducing rack space in colocation or data center environments translates to substantial cost savings

Architected for Innovators

Pure Storage supports modern data growth with scalable, development-focused infrastructure. Automation through policy-based management simplifies SLA, QoS, and configuration management, enabling seamless scalability and security for modern workloads.

Zero Move Tiering

Zero Move Tiering in Pure Storage Real-time Enterprise File Service offers intelligent data management that eliminates the complexity of legacy tiering systems, optimizing both performance and cost without manual intervention.

- **Performance predictability:** Dynamic resource allocation intelligently prioritizes data that requires high performance, ensuring consistent and predictable performance across workloads.
- **Cost efficiency:** The system efficiently manages both hot and cold data, adjusting performance based on demand without adding complexity or management overhead.
- **Infrastructure agility:** Workloads can transition seamlessly between different performance tiers, allowing organizations to move non-critical tasks to lower-performing storage classes while prioritizing new mission-critical workloads.

By automating tiering and optimizing resource usage, Zero Move Tiering simplifies storage management and improves overall system efficiency. The following image illustrates the Zero Move Tiering:

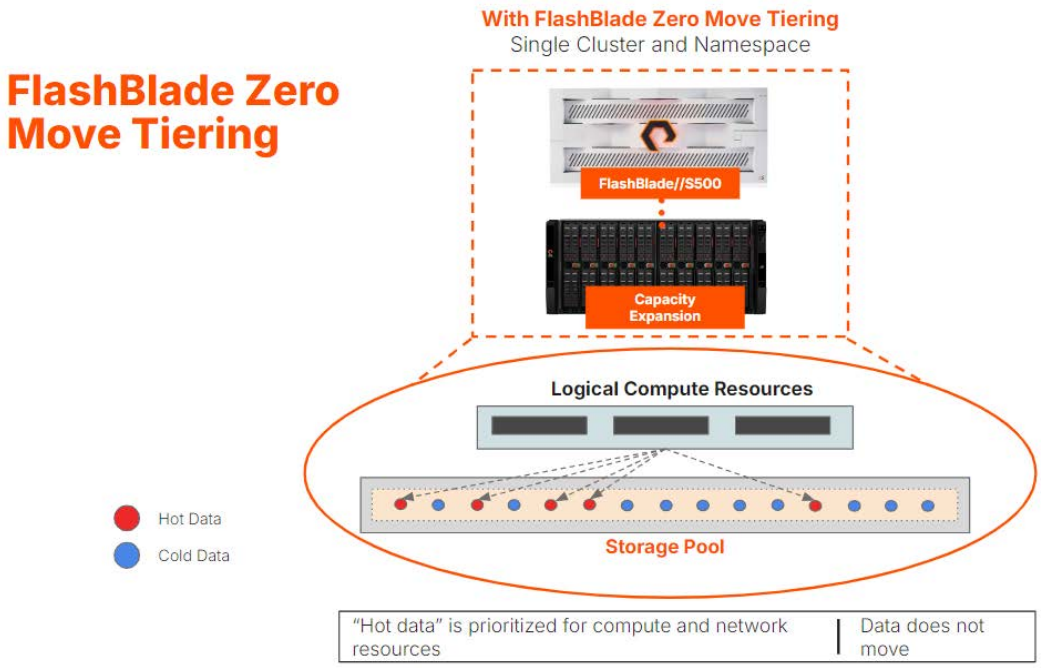

FIGURE 4 FlashBlade® Zero Move Tiering architecture

Always-on Quality of Service (QoS)

Always-on Quality of Service (QoS) in Real-time Enterprise File Service ensures that resources are consistently available across all workloads, ensuring reliable and predictable performance:

- **Optimize performance:** QoS automatically allocates resources intelligently, optimizing performance for business-critical applications without requiring manual intervention.
- **Eliminate management overhead:** This system prevents performance bottlenecks by automatically managing resource allocation, eliminating the need for complex configurations or manual tuning.
- **Consolidate workloads:** By protecting against resource contention, QoS ensures that even during unanticipated workloads, all file systems can service I/O efficiently, maximizing resource utilization without compromising performance. This differentiates Purity from competitors that require manual QoS configurations to manage runaway workloads.

Always On QoS simplifies resource management and delivers reliable performance while reducing administrative overhead. The following image illustrates Always On Quality of Service ensures that Workload 5 doesn't impact other workloads.

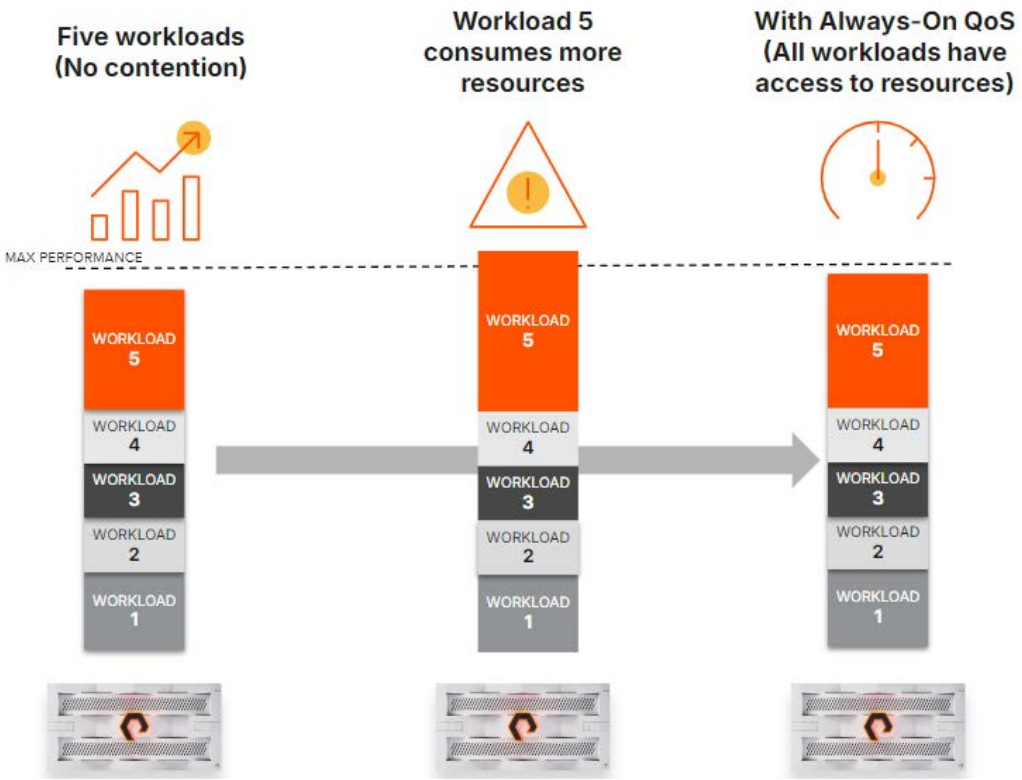

FIGURE 5 FlashBlade QoS options in Real-time Enterprise Architecture

Enterprise Management and Security Capabilities

Enterprise-grade capabilities that minimizes operational overhead while providing robust security features designed to combat modern cyber threats.

Isolated File Access

Pure Storage Real-time Enterprise File Service now supports Purity Servers, which provide data access isolation for file workloads. This enables secure management of multiple untrusted domains within the same infrastructure.

- **Data access isolation:** Isolated environments allow customers to securely manage and access data across multiple untrusted domains without compromising security.
- **Multiple share or export namespaces:** Supports the presentation of distinct share or export namespaces, enabling controlled data access for different domains.
- **Cross-domain sharing:** Facilitates secure data sharing between separate untrusted domains, ensuring isolation while maintaining access control.

This feature ensures secure file access across diverse environments, providing robust protection and flexibility for multi-domain use cases. The following image illustrates Isolated File Access for Purity.

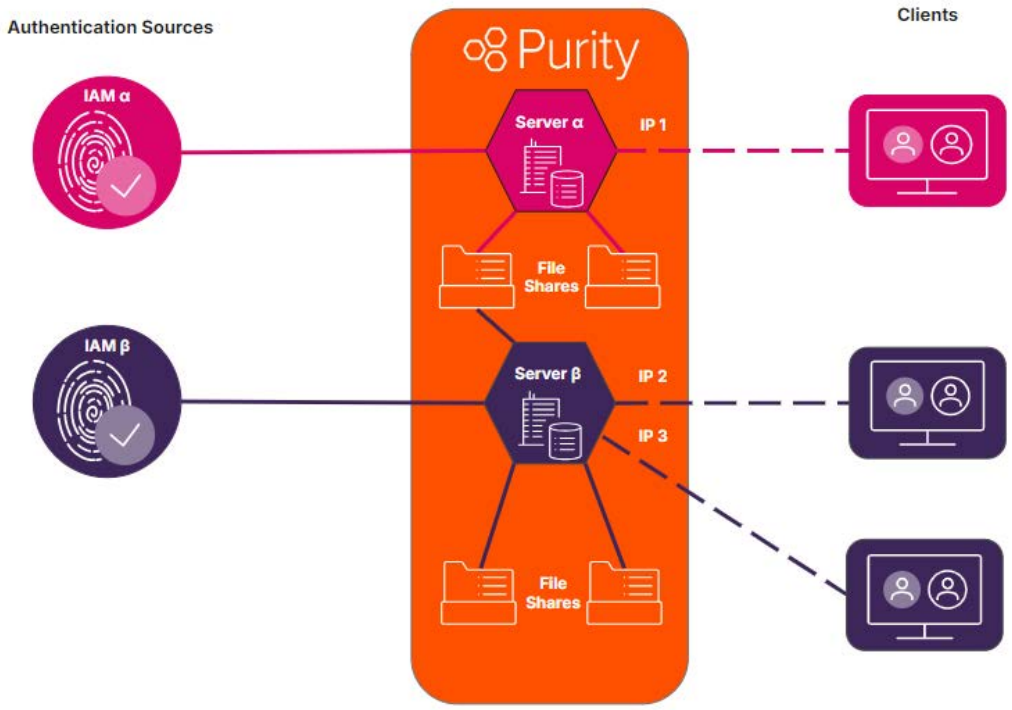

FIGURE 6 Secure multi-tenancy isolated file access

File Security Logging

Pure Storage Real-time Enterprise File Service includes comprehensive File Security Logging, with auditing enabled by default for all file systems.

- **Default auditing:** Purity automatically audits file access events, eliminating the need for manual configuration and ensuring that all security-relevant actions are logged from the start.
- **Enhanced security and forensics:** This logging system provides detailed event tracking for security and forensic purposes, allowing organizations to maintain full visibility into file access and system activity.
- **Default logging:**Purity default logging reduces operational trade-offs, allowing for forensic analysis without compromising performance. While auditing remains opt-in, with policies and SACLs required, security logging is integrated efficiently.

This feature strengthens file security by providing continuous, automatic event auditing without additional configuration. The following image illustrates file security logging.

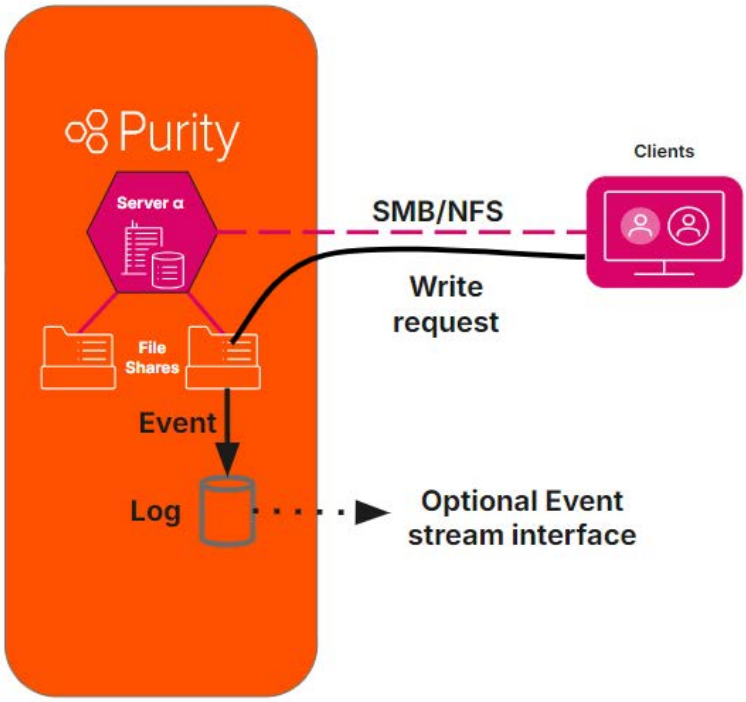

FIGURE 7 Secure multi-tenancy file security logging

Evergreen//One Performance and Capacity SLAs

Pure Storage Real-time Enterprise File Service offers performance and capacity SLAs that enable organizations to consume storage with the same flexibility and reliability as cloud services, providing consistency at scale.

- **Zero planned downtime:** Eliminates the need for scheduled outages, allowing for continuous operation and maintenance without service interruptions.
- **No data migration or forklift upgrades:** Simplifies the upgrade process by avoiding the complexities of data migration or major system overhauls, reducing operational risks.
- **Zero data loss:** Provides assurances that data integrity is maintained, safeguarding against potential loss during operations.

These SLAs enhance the reliability and performance of storage solutions, enabling us to host the critical business application data for 62% of Fortune 500 companies and 25% of Fortune 100 companies. This proven scalability and operational continuity have earned the trust of marquee customers across industries, supporting their most demanding workloads.

- **Consistent performance SLA:** Guarantees predictable performance across workloads, ensuring that applications operate smoothly under varying conditions.
- **Availability SLA:** Ensures high availability, minimizing downtime and providing a reliable storage solution that meets business demands.
- **Buffer capacity SLA:** Supports operational needs by maintaining sufficient buffer capacity to handle peak loads without degradation in performance.
- **Energy efficiency SLA:** Commits to energy-efficient operations, helping organizations reduce their carbon footprint while optimizing performance.

The following image illustrates the SLAs, guaranteed and commitment:

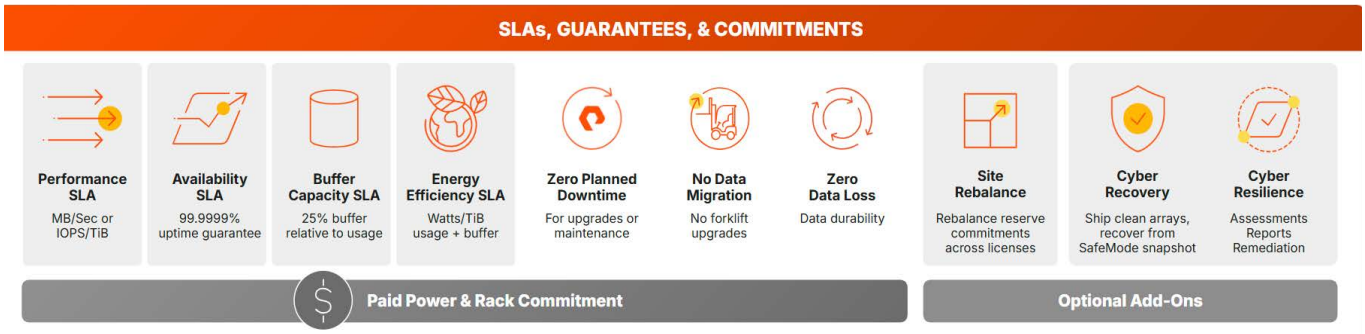

FIGURE 8 Evergreen//One SLAs

Use Cases

Real-time Enterprise File Service, powered by the Pure Storage platform, is helping organizations across various industries unlock new potential through cutting-edge AI/ML applications, creative production, and critical education infrastructure. By delivering seamless performance, scalability, and resiliency, the service addresses the demands of data-intensive operations while reducing complexity and enhancing operational efficiency. These real-world examples illustrate how diverse organizations are transforming their workflows, driving innovation, and delivering superior outcomes.

Optimizing Financial Services for Rapid Market Decisions

In the fast-paced world of financial markets, Options Technology required a robust infrastructure to power its analytics platform, enabling rapid data insights while minimizing operational delays and inefficiencies.

Solution:
By adopting FlashBlade® for analytics and FlashArray//X™ for enterprise databases, Options Technology streamlined its data processes. FlashBlade accelerated high-performance analytics, while FlashArray™ boosted performance for databases like SQL Server and Oracle. Together, these solutions ensured split-second insights critical for trading and financial analysis.

Results:

- Reduced job run times by 54%, freeing up to 50% of analysts' time
- Supported compute-intensive client analysis with improved performance and lower costs
- Eliminated 95% of support tickets and disruptive upgrade cycles
- Boosted data recovery efficiency with nightly snapshots and cloud-native protection

For more information, read the full case study: Options Technology Case Study.

Transforming Healthcare Data with Pure Storage

Healthcare organizations demand high-performance, reliable storage to power critical systems such as EHRs, imaging solutions, and life sciences research. Pure Storage simplifies data interaction, enabling quicker insights for improved patient outcomes.

Solution:
Pure Storage drives transformation across healthcare data systems, ensuring faster clinical insights and operational efficiency:

- **EHRs**: Eliminates delays in accessing clinical data for enhanced patient care
- **Enterprise imaging**: Accelerates imaging workflows for stabilized medical data access
- **Life sciences**: Speeds up genomics research and drug development timelines
- **Data protection**: Ensures robust ransomware protection with fast data recovery capabilities
- **Hybrid cloud**: Lowers costs and risks with scalable, flexible infrastructure

Results:
Healthcare organizations achieve improved patient care, operational excellence, and rapid data recovery while reducing costs and complexity.

For details, read the full case study: Pure Storage Healthcare Solutions.

Transforming Data into Insights using AI/ML

A leading research organization helps companies tackle their most ambitious and groundbreaking projects. To enhance collaboration with clients on large-scale AI initiatives, they required high-performing infrastructure capable of supporting data-intensive research.

Solution:
The organization adopted the Real-time Enterprise File Service powered by Pure Storage, leveraging FlashBlade as their core storage solution. This configuration provided researchers with the performance necessary to run multiple experiments simultaneously, enabling them to deliver results to clients more quickly.

Results:

- Streamlines collaboration with clients on groundbreaking AI projects
- Empowers researchers to conduct experiments without interruption, leading to faster results
- Supports a hybrid cloud strategy, offering both performance and flexibility

Delivering Always-on Learning for Every Student

A large school district, welcoming thousands of new students each year across 30+ campuses, needed to maintain continuous IT service to support education beyond traditional school hours. To handle rapid growth, the district re-evaluated its storage options.

Solution:
The district adopted the Real-time Enterprise File Service powered by the Pure Storage platform, providing scalable, high-performance storage that eliminates downtime during upgrades while ensuring room for future growth. Immutable snapshots further enhance ransomware protection and data recovery capabilities.

Results:

- Supports the addition of up to 2,500 new students annually with no strain on data-driven services
- Strengthens school safety with uninterrupted surveillance camera live streams
- Improves cybersecurity planning with immutable storage snapshots

These use cases illustrate how the Real-time Enterprise File Service powered by the Pure Storage platform can significantly enhance file management practices, driving efficiency and supporting strategic initiatives across the enterprise.

Solution Architecture

This section outlines the solution architecture of Real-time Enterprise File Services powered by the Pure Storage platform.

Pure Storage Platform

The Pure Storage platform architecture is designed to deliver a robust, scalable, and high-performance environment for file services. It leverages cutting-edge flash technology to optimize data access, enhance storage efficiency, and ensure operational reliability. Powered by Evergreen Architecture, this unified platform supports any workload, on any protocol, and at any scale. This is made possible through the innovative combination of DirectFlash hardware and the advanced Purity Operating Environment.

- **Any workload:** Supports a wide range of workloads, from mission-critical applications to general file sharing
- **Any scale:** Seamlessly scales to meet growing data demands, without complexity or disruption
- **Simple unified infrastructure:** Delivers a streamlined, unified platform for managing all file services

Overall, the unique architecture of the Pure Storage platform combines data reduction, high availability, and scalability, empowering organizations to effectively manage their data while optimizing costs and maintaining exceptional performance. The following image describes the Pure Storage platform.

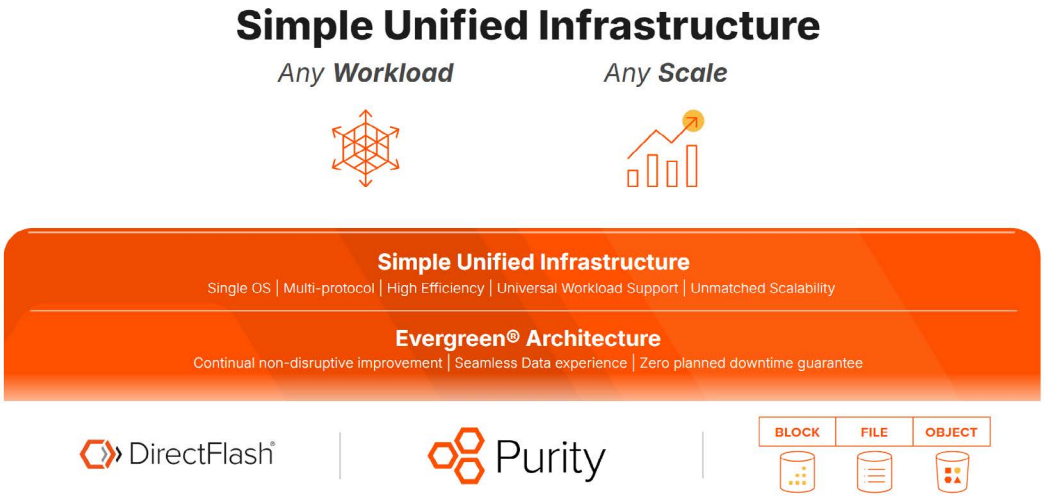

FIGURE 9 Simply unified infrastructure

Hardware Components

The Pure Storage platform is built on highly advanced hardware designed for top-tier performance, reliability, and scalability. Each component, including custom Pure Storage DirectFlash Modules (DFMs) that leverage NAND flash and quantum tunneling, is purpose-built to work seamlessly together. This ensures optimal data management, handling demanding workloads with ease. The platform's flexibility allows it to adapt to specific file service needs, delivering reliable, high-performance storage solutions for modern data environments.

Pure Storage DirectFlash Technology

DirectFlash technology eliminates the performance bottlenecks associated with traditional storage architectures with end-to-end NVME, which provides direct access to flash memory, resulting in lower latency and higher throughput and data reduction technologies like inline deduplication and compression to maximize storage efficiency.

By leveraging these advanced hardware components, the Pure Storage platform ensures organizations can efficiently store, manage, and protect their critical data while optimizing performance and reducing operational complexity for file services.

Scale-out vs. Scale-up in the Pure Storage Platform

The Pure Storage platform offers both scale-up and scale-out options, allowing organizations to tailor their storage infrastructure to meet varying needs.

Scale-up (vertical scaling):

- Involves adding more resources to a single Pure Storage system, enhancing performance for specific workloads
- Provides immediate performance improvements and simplify management

Scale-out (horizontal scaling):

- The Pure Storage platform supports scale-out architecture, allowing users to add multiple nodes to expand capacity and performance seamlessly.
- It enhances flexibility and resilience: if one node experiences issues, others maintain operation, ensuring high availability.
- Organizations can gain cost-effective growth enabling them to scale according to demand without large upfront investments.

Having both scale-out and scale-up options within the Pure Storage platform provides flexible, resilient, and efficient file services, making it an ideal choice for modern data environments. The following table describes the differences between the two architectures:

	Scale-up (Vertical Scaling)	Scale-out (Horizontal Scaling)
Description	Adds more resources (CPU, memory, storage) to a single system.	Expands capacity by adding multiple systems or nodes.
Performance	Provides immediate performance boost for specific workloads.	Seamless capacity and performance improvements across infrastructure.
Resilience	Highly-Available Dual Controllers provide redundancy.	Distributed architecture ensures high availability.
Cost	Larger upfront investments for significant upgrades.	More cost-effective growth as capacity can be added incrementally.

TABLE 1 Scale-up (vertical scaling) vs scale-out (horizontal scaling)

The following image illustrates the difference between Scale-Up versus Scale-Out for Pure Storage platform.

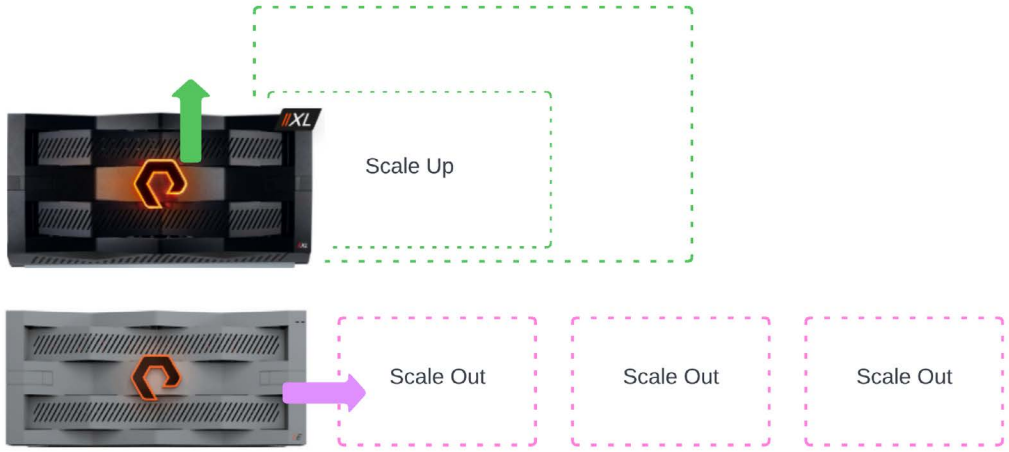

FIGURE 10 Difference between scale-up vs scale-out

FlashArray

The core storage solution, FlashArray utilizes all-flash technology to provide high-speed performance for block storage:

- **Sub-millisecond latency:** Ensures rapid response times for applications
- **High transaction:** Supports demanding workloads with high transaction rates
- **Redundant components:** Designed for high availability and reliability

FlashBlade

Optimized for unstructured data, FlashBlade offers a scalable and high-performance solution for file and object storage.

- **Massive parallelism:** Delivers exceptional performance for analytics and large-scale data workloads
- **Flexible scalability:** Easily expand capacity and performance as data grows
- **Multi-protocol Support:** Enables simultaneous access via NFS, SMB, and S3

Supported File Service Protocols

The following table describes the supported file services protocols with Pure Storage platform.

Protocol	Description	Version
NFS	Network File System, commonly used in Unix/Linux environments.	V3, V4.1
SMB	Server Message Block, widely used in Windows environments.	V1, V2, V2.1, V3, V3.1.1

TABLE 2 Pure Storage platform supported file services protocols.

Hardware Configuration Options

The following table describes the hardware configuration options for Pure Storage platform.

Feature/Specification	Pure Storage FlashArray	Pure Storage FlashBlade
Primary Use Case	Block storage for databases and enterprise apps	Unstructured data storage, analytics, and AI
Architecture	Centralized with dual controllers	Scale-out architecture with distributed nodes
Storage Medium	High-density NAND flash SSDs	High-density flash storage modules
I/O Protocols	Fibre Channel, iSCSI	NFS, SMB
Capacity Scaling	Scale-up (adds capacity within a system)	Scale-out (add nodes for more capacity)
Performance Optimization	Optimized for low-latency, high IOPS workloads	Optimized for high throughput and parallel processing
Typical Configuration	Dual controllers	Multiple nodes with distributed controllers
Data Reduction	Inline deduplication and compression	compression
Management Interface	Pure1 Cloud Management	Pure1 Cloud Management
Maximum Capacity	Varies by model; can exceed hundreds of TBs	Can scale to multiple petabytes
Flash Technology	Enterprise-grade flash with various endurance ratings	Flash designed for high performance and density
Network Interfaces	10GbE, 25GbE, 16Gb/32Gb FC, iSCSI	10GbE, 25GbE, 40GbE for high throughput
RAID Configuration	Built-in RAID options for data protection	Distributed redundancy across nodes
Latency	Sub-millisecond latency	Low-latency for file operations

TABLE 3 FlashArray and FlashBlade configuration options

Enterprise Ready Security and Data Protection

This section describes the enterprise read security and data protection for this solution.

Third-party Backup Solutions: Veeam and Commvault

Integrating third-party backup solutions like Veeam and Commvault with the Pure Storage platform enhances data protection and recovery capabilities. Veeam seamlessly integrates with Pure Storage, enabling fast, reliable backups with minimal performance impact. Its instant VM recovery feature allows quick restoration of operations, while advanced deduplication and compression optimize storage usage and reduce costs. Commvault offers a comprehensive data management platform that automates backup and recovery processes. With its policy-driven approach, organizations can customize backup schedules and retention policies, ensuring critical data is protected across on-premises, hybrid, and cloud environments.

By utilizing Veeam and Commvault alongside the Pure Storage platform, organizations can strengthen their data protection strategies, ensuring efficient recovery and comprehensive management of their information assets.

Authentication for File Services

Authentication for file services on the Pure Storage platform secures data by validating user identities before granting access. It supports multiple protocols, enabling easy, secure data sharing across Windows and Linux environments, streamlining collaboration across teams:

- **Active directory (AD) integration:** Leverages existing user management systems for streamlined access control
- **LDAP:** Allows integration with Lightweight Directory Access Protocol for centralized user authentication
- **Kerberos authentication:** Provides secure, ticket-based authentication for SMB connections
- **NTLM (NT LAN manager):** Offers a challenge-response authentication protocol for legacy systems
- **AUTH_SYS:** Facilitates UNIX-based authentication for NFS environments

These authentication methods ensure that only authorized users can access sensitive file data, helping organizations maintain compliance with data security regulations while protecting valuable information assets.

Best Practices

The automatic tuning capabilities of Purity relieve administrators of the burden of manual performance optimization, ensuring consistent, optimal performance without the need for complex configurations. However, to achieve the best possible performance, it is essential to adopt certain system, network, and environment best practices for optimal performance:

- **Optimize NFS settings for performance and security:** Use NFS version 4.1, which offers stateful connections and improved caching. Tune NFS settings such as read and write sizes based on workload characteristics to enhance file access speeds and reduce latency.
- **Implement adaptive quality of service (QoS):** Utilize the Adaptive QoS feature to prioritize critical applications. Set performance limits for less critical workloads to ensure that high-priority tasks maintain optimal performance without interference.
- **Adjust FlashBlade file system settings:** Fine-tune the file system configurations within FlashBlade. Use the management interface to select appropriate block sizes based on workload—smaller blocks for small files and larger blocks for large datasets—optimizing I/O performance.
- **Implement high-availability settings:** Ensure high-availability features are enabled to maintain performance during node failures. Configure failover options to minimize disruptions and ensure uninterrupted access to critical files.

By implementing these best practices, organizations can fully harness the capabilities of the Real-time Enterprise File Service with Pure Storage platform, achieving high levels of efficiency and responsiveness in their file management operations.

Conclusion

In today's fast-paced digital environment, the challenges of managing data are increasing. Legacy file architectures, characterized by their complexity and rigidity, prevent organizations from achieving the scalability and agility necessary for success. As businesses strive for real-time access to data, the limitations of these outdated systems become apparent: costly migrations, insufficient adaptability to evolving cyber threats, and heightened risks of data breaches.

The Real-time Enterprise File Service, powered by the Pure Storage platform, presents comprehensive solutions to these urgent challenges. By delivering instant, low-latency access to file data and ensuring seamless scalability, this service transforms the management and interaction with data. Features such as unified architecture, fleet management, zero move tiering, performance and capacity SLAs, always on quality of service, isolated file access and file security logging, and AI empower organizations to enhance performance while minimizing operational overhead and security risks.

Robust performance and capacity SLAs features like Zero Planned Downtime, No Data Migration or Forklift Upgrades, Zero Data Loss, Consistent Performance, Availability, Buffer Capacity, and Energy Efficiency allow organizations to proactively manage their environments and maintain consistent performance without compromising reliability or incurring unnecessary costs

By adopting the Real-time Enterprise File Services powered by FlashArray and FlashBlade platforms, organizations can focus on business needs such as optimizing financial services, transforming healthcare data, transforming data into insights using AI/ML, and delivering always-on reliability for every user. Pure Storage allows organizations to navigate obstacles presented by legacy systems and position themselves for success in a data-centric world. Transitioning to a unified, agile storage solution not only improves operational efficiency but also drives innovation and competitiveness in an era defined by rapid change.

Get in Touch

To learn more about how Pure Storage and Real-time Enterprise File Service can help you meet challenges head-on, book a meeting with an expert.

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