Solution Brief

Pure Storage FlashArray//X
Intel® Xeon® Scalable Processors
Hybrid Cloud

On-Ramp to the All-Flash Cloud

Experience the Intel® Optane™ Solid State Drive–based all-flash storage solution that simplifies cloud deployment and helps reduce costs.

Cloud technology offers two core principles with implied cost savings:

1. Massive consolidation, with standardized hardware and centralized data centers, for capital expenditure (CapEx) savings

2. Full automation, with user self-service built in to simplify and orchestrate IT services and help lower operating expenses (OpEx)

Many IT departments want all of these cloud-like attributes, but with enterprise-grade resiliency.

As the technical foundation of the modern cloud, virtualization and flash-based technologies make these goals possible. Pure Storage has become the all-flash foundation not only for consumer cloud leaders, but also for software-as-a-service (SaaS) and infrastructure-as-a-service (IaaS) public cloud leaders, in addition to large-scale private cloud leaders. Already some of the world's largest cloud-focused companies run on Pure Storage all-flash storage (see Table 1).

Introduced to the market in 2011, Pure Storage has an extensive history of flash storage and cloud innovations, including the latest in Intel® technologies.

Table 1. Selected Pure Storage customers

SaaS	Healthcare	Government	Finance
ServiceNow	St. Joseph's Health	VIA Metropolitan Transit	Toyota Financial Services
Reval	Wellsource	City of New Orleans	Ingenico Group
Geographic Solutions	Grupo Mafra	Scottish Government	Booster

All-flash storage: FlashArray//X

Chaos, disruption, and slow applications keep you from focusing on growing your business. Pure Storage FlashArray//X arrays can help you beat back your IT fires effortlessly, without burning your budgets. Put out your IT fires for good with 100 percent NVM Express (NVMe) all-flash storage that can scale non-disruptively in capacity or performance as your workload requirements change.

Key benefits of Pure Storage solutions

- **Your storage stays Evergreen.** Pure Storage has not only revolutionized enterprise storage components, it has reinvented ownership and IT agility. With its Evergreen Storage model, enterprise storage grows and evolves with the needs of your organization—providing value and IT agility for a decade or more. You can deploy once and upgrade your capacity, performance, and features. And you can make those upgrades without disruption and without rebuys, all while your data stays in place. Only Evergreen Storage has delivered these benefits year after year.

- **Enterprise-proven.** Designed for 99.9999 percent availability, 100 percent performance through upgrades and maintenance (meaning your storage still runs while you change or fix it), built-in data protection, and predictive support, the FlashArray//X solution will have you wondering why anyone would settle for less.[1] Featuring Intel Xeon Scalable processors, the FlashArray//X solution allows you to operate worry-free and experience a new level of satisfaction with an industry-leading certified Net Promoter Score (NPS) of 83.5.[2]

- **Simplified, easy-to-manage enterprise storage.** The extreme simplicity of the Pure Storage suite of appliance-like solutions enables quick and painless installations in less than an hour, and provisioning within seconds—no manuals, no training, and no tuning required.[3] With 100 percent performance through upgrades and maintenance, you can eliminate downtime. This allows you to:

  - Become effective from day one
  - Drive productivity gains by servicing requests faster and from anywhere
  - Accelerate key applications with all-flash performance and resiliency
  - Consolidate all your workloads

Storage-class memory for FlashArray//X

Applications run faster in memory, but scaling up memory is often uneconomical. Storage-class memory (SCM) helps bridge this gap between storage and memory performance to further accelerate performance on Pure Storage FlashArray//X through DirectMemory Cache. It introduces software-integrated SCM technology as part of the core operating system, Purity for FlashArray. SCM automatically refers reads from flash media in the array to onboard DirectMemory modules (DMMs) to provide DRAM-like performance.

At the heart of DirectMemory Cache are Intel Optane Solid State Drives (SSDs). Its high speed and density help mitigate processing bottlenecks and improve performance in demanding applications like online transaction processing (OLTP) and in-memory databases, and they form the basis of SCM in DirectMemory Cache.

Once DMMs are non-disruptively added to a new or existing FlashArray//X70 or FlashArray//X90 storage array, DirectMemory Cache immediately begins working without the hassle of configurations or tuning. You can expect the array to commence providing read-latency improvements, along with additional throughput, for all FlashArray workloads—the most notable of which are OLTP and in-memory databases, such as SAP HANA.

SAP HANA uses a hot/warm/cold tiering scheme to increase efficiency. Warm data is stored in the SAP HANA Native Storage Extension (NSE) datastore, allowing less frequently accessed data to be managed by accessing it from disk as opposed to in-memory. In performance testing and analysis of online analytical processing (OLAP) operations, warm data stored in FlashArray//X with DirectMemory Cache had only a slight degradation in performance (10 percent) compared to in-memory data, but it saved up to 60 percent of the cost.[4] Additionally, with DirectMemory Cache for FlashArray//X, query performance of data in SAP HANA NSE can be increased by more than 40 percent when compared to previous-generation FlashArray//X without DirectMemory Cache.[5]

Additional performance through Intel technologies

If you're like most administrators, your storage solution supports many different applications; when one of those applications starts causing problems for you and your users, it might cause problems for many other users as well. To combat this all-too-common issue, Intel Xeon Scalable processors use Intel Resource Director Technology (Intel RDT) to help with better utilization and allocation of processor resources.

By providing minimum service allocations at the silicon level, Intel Xeon Scalable processors allow preferential allocation of cache and memory resources with quality of service (QoS) benefits. They also provide increased memory bandwidth speeds over previous-generation Intel Xeon processors, which provides the ability to process larger datasets. What does this mean in terms of the Pure Storage FlashArray//X array? Your storage will be more than able to keep up with whatever data demands you throw at it. Additionally, the FlashArray product's ability to upgrade to higher-performance controllers non-disruptively makes quick work of addressing ever-growing workloads.

Overall, Pure Storage's mission is to simplify the enterprise data center–management process to make your life easier. Imagine significantly reducing the time spent on managing maintenance tasks, configurations, migrations, and outages. Whether you select a stand-alone FlashArray or Pure Storage's converged modular infrastructure solution with Cisco, called FlashStack, Pure Storage will help you put out those IT fires. Get your nights and weekends back, and look forward to repurposing your time toward more strategic efforts.

To see these benefits in action, take a look at two customers—Aegis Sciences, a Nashville, Tennessee–based toxicology lab, and Betfair, one of the world's largest gaming sites based in the UK—who can now see the benefits of business transformation with Pure Storage.

The Modern Data Experience™

Simplify the complex, focusing on fast and future-ready infrastructure
so you can create tomorrow's next big idea.[6]

It's simple	**It's seamless**	**It's fast**	**It's future-ready**
60	**1**	**85%**	**45%**
minutes to install	data layer for all	faster queries*	lower TCO*

* With professional services

> "Pure Storage has proven to be predictable, with no surprises. When the NIH asks us how our infrastructure is holding up under the increased load, we can report without hesitation that it's doing well. We prevented performance bottlenecks, and capacity is a non-issue."
>
> — **Tim Ryan**, CIO of Aegis Sciences

Aegis Sciences processes more tests more quickly with Pure Storage

To meet an urgent need for COVID-19 testing, Nashville, Tennessee–based toxicology lab Aegis Sciences scaled its infrastructure with Pure Storage to process more tests more quickly as they became the go-to regional lab for federal, state, and local task forces. Aegis Sciences already relied on Pure Storage FlashArray products to run its VMware and Microsoft SQL Server systems and applications. When Tim Ryan, CIO of Aegis Sciences, made the decision to invest in Pure Storage a couple of years earlier, Pure's Evergreen Storage subscription model stood out.

Aegis took full advantage of the Evergreen Storage program to upgrade storage on demand and scale to meet growing testing needs—from 3,500 COVID-19 tests per day to 60,000. The lab is now well equipped to handle the expected influx of tests and to get accurate results out within 24 hours—key to slowing the spread of the virus. With Pure, CIO Tim Ryan is confident that Aegis Sciences has the capacity, performance, and support it needs to handle whatever comes its way.

Betfair optimizes and strengthens best-in-class betting exchange with Pure Storage

Another customer, Betfair, also wanted to reduce complexity in its IT environment by creating an on-premises cloud.

Launched in 1999, Betfair is now one of the largest betting and gaming operators in the UK. With 1,500 employees spread between its London headquarters and offices in Malta, Gibraltar, and Romania, the company serves an international clientele, matching bettors on each side of a wager.

Eliminating the performance bottleneck in an on-premises cloud

Betfair's developers use an on-premises cloud to develop and deploy applications that demand up to 300 virtual machines (VMs). "We needed to be much more agile and push through code deployment much faster," says Dean Hogan, Cloud Platform Lead at Betfair. "Deploying large-scale complex systems, 55 VMs with code and configuration, would take hours to create with the existing traditional storage arrays. Our target was to do this—and create a 1 TB database to support the application—in 20 minutes."

Remove the handbrake—traditional disk-based storage arrays

Betfair knew it needed a flash-based storage solution to meet its performance requirements, but it was unsure about whether to go for a flash-only solution or to take the hybrid disk and flash route. Betfair was able to test the impact of Pure Storage FlashArray products on its cloud environment through a proof of concept in its own data center. The FlashArray products outperformed others on the performance and efficiency criteria that Betfair set. Betfair didn't want to opt solely for the cheapest system—meeting the business requirements was critical. Pure Storage's solution won on both points.

> "From performance to cost savings, we have truly transformed our business capability with Pure Storage. We can now spin up hundreds of IaaS and PaaS offerings in as little as 40 minutes, compared with six or more hours previously."
>
> — **Dean Hogan**, Cloud Platform Lead at Betfair

"Our business is all about pace and getting product features to market rapidly," says Hogan. "We are heavily focused on development, and need to move our application testing and release cycles from a daily rate towards hourly. With Pure Storage on our side, we can better seek opportunities and build for events at a serious pace." Once deployed, the results from Pure Storage were even greater than Betfair anticipated.

Smaller, faster, more flexible—and unforeseen benefits

"Pure Storage provided more than just a speed advantage," says Hogan. "From performance to cost savings, we have truly transformed our business capability with Pure Storage. We can now spin up hundreds of IaaS and PaaS offerings in as little as 40 minutes, compared with six or more hours previously. The FlashArray allows us to deliver new development platforms faster than we thought possible." For this reason, plus the simplicity and non-disruptive advantage that Pure Storage offers, Betfair is confident in its choice of Pure Storage as a long-term partner.

Start your journey to the all-flash cloud

Initially, flash storage might have seemed too risky for most, and too costly, even for the enterprise. But today, with both leading-edge and established companies betting on Pure Storage as their long-term storage partner, it's time to consider the leap to all-flash storage. To help with your decision matrix, here are financial analyses and ownership models for your reference:

- **FlashArray storage solutions pay for themselves in two years.** Forrester details the many business benefits of going all flash with FlashArray—including major cost savings. Read the report.

- **A better model of ownership.** With Evergreen Storage, IDC sees a new upgrade model that eliminates the expense, risk, and disruption of both incremental and forklift upgrades. Achieve simplicity and savings while expanding and modernizing your storage every year. Read the IDC story.

Flash has revolutionized the data center, driving down the cost of data storage while speeding innovation and increasing organizational agility. By making use of Intel's enhancements in Intel Optane SSDs and Intel Xeon Scalable processors, Pure Storage is able to continuously increase the performance of its storage controllers, resulting in lower latency and higher throughput for customers' business-critical workloads. Pure's proprietary DirectFlash architecture is uniquely capable of making use of raw CPU power to streamline the data path and deliver outstanding customer experiences.

For more info on how to get started with Pure Storage, please contact your local sales team today.

- Want more info? Check out the Gartner 2020 Magic Quadrant for Primary Storage Arrays analyst report.

- Ready to look at projected cost savings? Calculate your own return on investment (ROI) here.

To learn more, visit **purestorage.com/flasharray-x** and **intel.com/storage**.

intel.

[1] Pure Storage. "Purity Operating Environment." January 2021. purestorage.com/content/dam/pdf/en/datasheets/ds-pure-storage-purity.pdf.

[2] Pure Storage. "Demystifying Net Promoter Scores." March 2020. https://blog.purestorage.com/products/demystifying-net-promoter-scores/.

[3] Pure Storage. "Improving SAP HANA Performance—Again." February 2020. https://blog.purestorage.com/solutions/improving-sap-hana-performance/.

[4] Pure Storage. "Reducing costs for SAP HANA with Pure's DirectMemory Cache." September 2019. https://blog.purestorage.com/purely-technical/sap-hana-pure-directmemory-cache/.

[5] In testing conducted by Pure Storage, FlashArray//X70 R3 achieved 24,000 queries completed/second compared to 17,000 queries completed/second with FlashArray//X70 R2. Source: Pure Storage. "Improving SAP HANA Performance—Again." February 2020. https://blog.purestorage.com/solutions/improving-sap-hana-performance/.

[6] Pure Storage. "Why Pure." purestorage.com/why-pure.html.