



Datasheet

Unlock the Full Potential of NVMe with the AFF A800 Array

NetApp leads the way with the first all-flash array to support NVMe over Fabrics, delivering superior NVMe storage IOPS and bandwidth with advanced data management

Get the First All-Flash Array with End-to-End NVMe

The NetApp® AFF A800 is the first all-flash array to combine the performance of NVMe SSDs and NVMe over Fabrics, delivering sub-200µs latency and massive throughput in a scale-out architecture.

Ease the Transition to NVMe Performance

Upgrade to a modern SAN with a simple software upgrade and leverage existing Fibre Channel and NVMe-accelerated workloads on the same fabric. Support 60% more workloads or cut application response time in half.

Create a Data Pipeline from Edge to Core to Cloud

Move data quickly and easily, among on-premises locations or to and from the cloud. Facilitate AI and advanced analytics workflows with the industry's most cloud-connected flash storage.

Making the End-to-End NVMe Flash Data Center a Reality

It has become imperative for IT teams to modernize infrastructure, both to support new artificial intelligence (AI) workloads and to accelerate performance and drive efficiencies for existing applications. Flash storage arrays and the all-flash data center play a critical role in these enterprise modernization efforts.

As flash solid-state drive (SSD) devices continue to evolve, storage and networking protocols that were designed for the hard-disk era can no longer keep up. NVMe Express (NVMe) is the next step in the evolution of flash storage, offering far greater I/O parallelism, increased bandwidth, and lower latency versus the SATA-interface SSDs that are widely used today.

However, simply replacing SATA SSDs with NVMe SSDs just exacerbates a growing problem. As storage arrays become steadily more powerful, storage networks can become a bottleneck to further bandwidth and latency gains. If you simply replace a flash array that has SATA SSDs with one that has NVMe SSDs, you won't see the full benefit of the increased performance NVMe provides.

In a study of all-flash arrays and network performance carried out almost 2 years ago, Gartner found that I/O performance bottlenecks were already moving to the storage network. Network upgrades doubled or quadrupled application performance.

An NVMe-based storage system demands high-performance I/O connectivity to deliver the bandwidth, IOPS performance, and extremely low latency of NVMe. (See Figure 1.) When we at NetApp designed the AFF A800, our first all-NVMe array, we weren't satisfied to simply replace SAS-connected SSDs with NVMe SSDs. The AFF A800 is the first flash array on the market to support NVMe SSDs and NVMe over Fabrics (NVMe-oF). It provides end-to-end NVMe connectivity between storage arrays and host servers for maximum bandwidth, high IOPS, and the lowest possible latency. And it's all in a compact 4U chassis, offering 48 internal NVMe SSDs for exceptional density. The AFF A800 future-proofs your data infrastructure with NetApp ONTAP® 9, the industry's leading data management software.

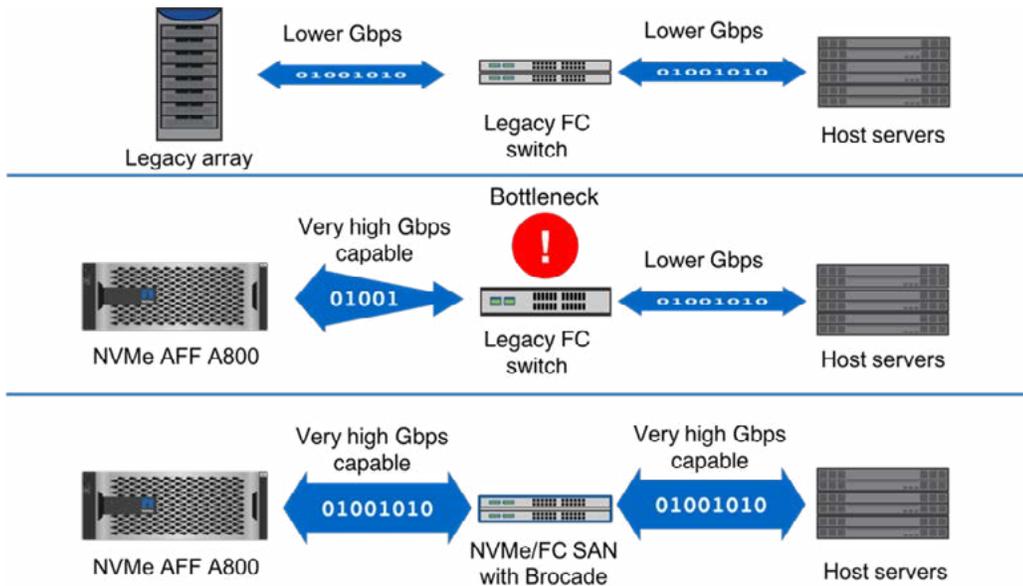


Figure 1) Traditional storage networks can't deliver the bandwidth and the low latency of NVMe SSDs to host servers.

The Modern SAN: End-to-End NVMe Performance

NVMe over Fabrics extends the benefits of NVMe to your entire data center

Increasing enterprise data demands create stress across your entire IT infrastructure. The volume of data that is being collected and the importance of that data to your business are growing, seemingly without limit. The ability to process more data in less time is a critical competitive advantage; it enables real-time data analysis, accelerates decision making, and makes AI and deep learning possible. Achieving the lowest possible I/O latency is critical to accelerate individual transactions and to enable new applications.

As a storage industry leader, NetApp understands better than most the benefits and the challenges of delivering end-to-end I/O performance to drive demanding applications from AI pipelines to real-time trading. Fast storage arrays require an equally fast pathway to your host servers. NetApp has been vocal in its support of NVMe and NVMe-oF from the start.

NVMe is more than just a replacement for the existing SATA and SAS interfaces. NVMe is an open collection of standards for accessing and managing high-performance solid-state memory devices (nonvolatile memory, or NVMEM) such as flash and 3D XPoint. The primary specification (NVMe 1.2.1) provides an interface for accessing these devices over a Peripheral Component Interconnect (PCI) bus.

The specification for NVMe-oF describes an approach for extending NVMe across network fabrics at scale, allowing multiple storage arrays and host servers to exchange data at NVMe speeds. (See Figure 2.) NVMe-oF supports four fabric options: Fibre Channel (FC), InfiniBand, RoCE, and iWARP, making possible the continued evolution of the SAN.

Accelerating the Transition to NVMe and Modern SAN

FC simplifies the transition to NVMe-oF

Because FC is in widespread use as a storage network, it offers numerous advantages as the foundation of a modern SAN. Perhaps the biggest advantage is an ability to support both Fibre Channel Protocol (FCP) traffic and NVMe over FC (NVMe/FC) traffic at the same time. This capability eases the transition from existing storage and FCP to NVMe-based storage and NVMe-oF.

With NVMe/FC, you can upgrade your FC SAN and support new NVMe storage arrays and existing SAN storage at the same time on the same network. You don't have to deploy and run

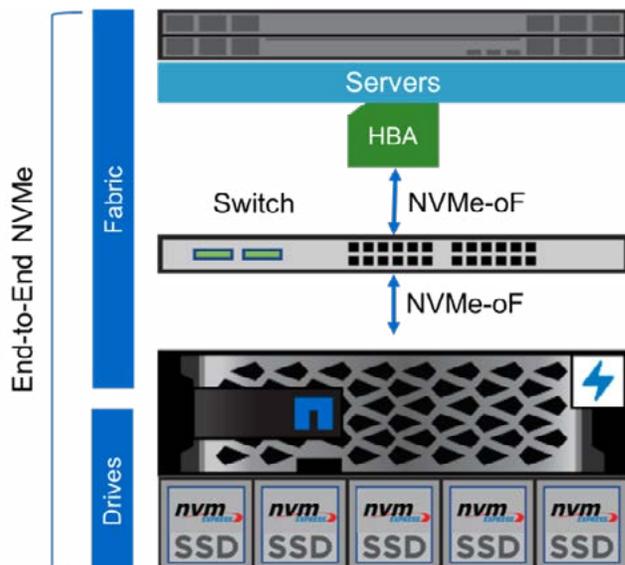


Figure 2) NVMe-oF provides a high-bandwidth, low-latency interconnect between host servers and storage, modernizing your SAN for the next era of computing.

a separate network in parallel with your existing SAN to see the benefits of end-to-end NVMe performance. And your team doesn't have to learn to manage an entirely new and exotic network to benefit from the performance gains that NVMe provides.

NetApp has partnered with Brocade, a leading supplier of FC storage networks, to enable NVMe/FC. NetApp was the first storage vendor to offer Brocade's 32Gb Gen 6 FC solution, beginning in 2016. A nondisruptive firmware upgrade is all that's required to enable users of Gen 6 Brocade switches to support NVMe/FC in parallel with FCP.

It would be reasonable to ask why switching from FCP to NVMe/FC yields performance benefits, given that the two can share the same underlying FC network. FCP is an implementation of SCSI over Fibre Channel. Because SCSI was designed for hard disks, the protocol is not ideal for high-speed solid-state devices, and therefore it's not as efficient as NVMe. NVMe/FC is highly parallel and delivers greater bandwidth, higher IOPS, and lower latency than FCP does. When you upgrade to NVMe/FC, you can deliver up to 60% more IOPS or cut application response time in half.

Introducing the AFF A800 Array

The industry's first all-flash array with end-to-end NVMe

The new NVMe-based NetApp AFF A800 is the first all-flash array in the industry to support NVMe SSDs and NVMe/FC connectivity. The AFF A800 extends the benefits of enterprise-grade flash to leading-edge applications, including AI and deep learning, without sacrificing any of the data management features that you expect from ONTAP.

Cloud-connected leader

The AFF A800 is world's fastest, most cloud-connected all-flash array. You can connect to more clouds, with more intelligent cloud services. Running on ONTAP software, AFF A800 allows you to move your data and applications where they run best, either on the premises or in the cloud, leveraging the same ONTAP data management. Embrace multicloud by using Amazon Web Services (AWS), Azure, Google Cloud, and other leading cloud providers for backup, disaster recovery, tiering, cloud analytics, and workload bursting for business agility. ONTAP lets you harness the power of the hybrid cloud.



Figure 3) NetApp AFF A800 delivers exceptional performance in both NAS and SAN configurations.

Simplicity and efficiency

The AFF A800 is simple to deploy. You can have a new system up and running in just 10 minutes. And with inline data reduction capabilities, including deduplication, compression, and compaction, the AFF A800 provides capacity savings up to 10x, increasing effective capacity. The AFF A800 offers leading density with effective capacity of over 2.5PiB in a single 4U system, for a storage footprint that's up to 37 times smaller.

Industry-leading performance by every measure

The AFF A800 delivers sub-200µs latency, 1.3M IOPS at 500µs latency and massive throughput of up to 34GB/s with an HA pair. A NAS cluster delivers up to 11.4M IOPS at 1ms latency, 300 GB/s of throughput and 316PB of effective capacity. A SAN cluster delivers up to 7.8M IOPS at 500µs latency, 204GB/s of throughput, and 158PB of effective capacity. Key performance metrics are summarized in Figure 3.

NVMe Performance and Connectivity in a Compact Design

The NetApp AFF A800 is designed to deliver extreme performance from a compact package. Each 4U chassis accommodates dual controllers for high availability (HA) and includes 48 slots for NVMe SSDs. In addition to 32Gb and 16Gb FC, network options include the storage industry's first 100GbE connectivity, as well as 40GbE and 10GbE.

An NVMe-powered SAN scale-out cluster supports up to 12 nodes (6 HA pairs) with 1,440 drives and nearly 160PB of effective capacity. NAS scale-out clusters support up to 24 nodes (12 HA pairs).

For detailed AFF A800 specifications, see the [AFF datasheet](#).

Deliver Superior Results for Modern Business

Digital transformation and new business models are changing the face of the modern enterprise and are putting new pressure on IT teams. As you build out the data pipelines that will fuel your business from edge to core to cloud, enabling big data analytics and AI, you need the right data infrastructure partner. NetApp understands your requirements and can support your business both on-premises and in the cloud. NetApp leads the industry with all-flash innovation and performance. When you combine performance leadership with advanced data management services and best-in-class cloud integration, NetApp AFF A800 is an unbeatable solution.

About NetApp

NetApp is the data authority for hybrid cloud. We provide a full range of hybrid cloud data services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation. Together with our partners, we empower global organizations to unleash the full potential of their data to expand customer touchpoints, foster greater innovation and optimize their operations. For more information, visit www.netapp.com. #DataDriven