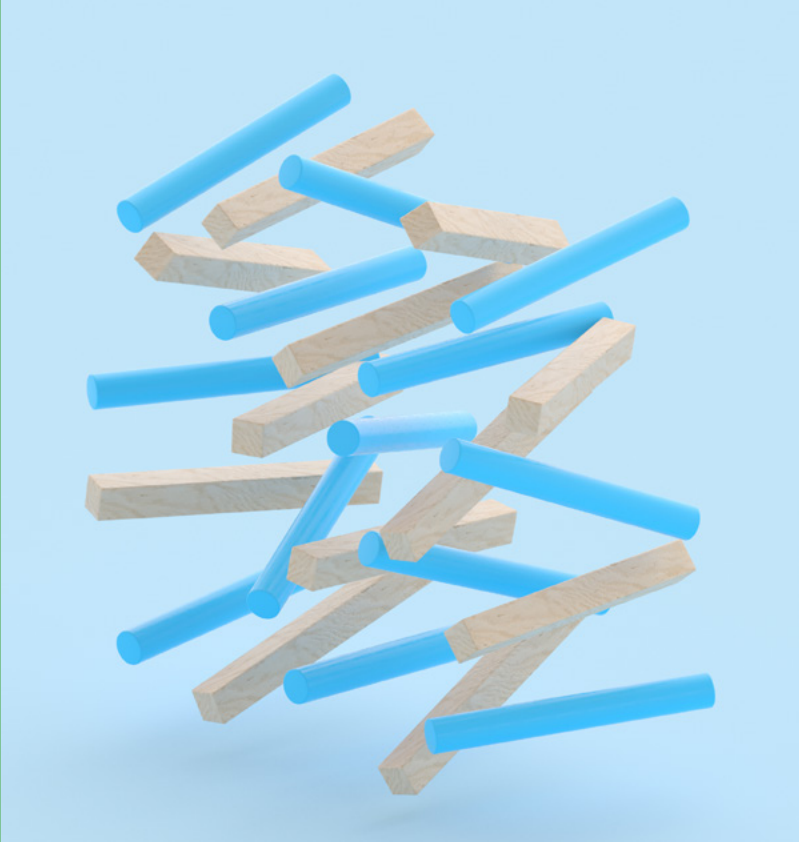


DATASHEET

NetApp AFF A-Series

Leading the future of flash



Data driven organizations require an agile and efficient IT infrastructure to meet the demand for fast, secure, and continuous data access. A fundamental first step in undertaking an IT transformation is to modernize your infrastructure with all-flash storage to improve speed and responsiveness for critical business applications. New workloads, such as data analytics, artificial intelligence (AI), and deep learning (DL), demand extreme performance that first-generation flash systems cannot deliver. Additionally, more and more organizations are adopting a “cloud first” strategy, driving the need for enterprise-grade data services for a shared environment across on-premises data centers and the cloud. As a result, modern all-flash arrays must provide robust data services, integrated data protection, seamless scalability, and new levels of performance—plus deep application and cloud integration.

Cloud-Connected Flash Storage Powered by ONTAP

IT departments need smart, powerful, trusted solutions that take advantage of modern cloud technologies. NetApp® AFF A-Series systems are designed to help organizations accelerate their infrastructure transformation and fuel data-driven strategies. Powered by NetApp ONTAP® data management software, AFF systems deliver the industry’s highest performance, superior flexibility, and best-in-class data services and cloud integration to help you accelerate, manage, and protect your business-critical data in the hybrid cloud.

A wide range of customers, from enterprise to midsize businesses, rely on AFF to:

- Simplify operations with seamless data management, on the premises and in the cloud.
- Accelerate traditional and new-generation applications.
- Keep business-critical data available, protected, and secure.

Key Benefits

Accelerate Applications

- Speed up your critical applications with the industry’s fastest end-to-end NVMe enterprise all-flash array.
- Accelerate artificial intelligence and machine learning applications with lowest latency.
- Support 2 times more workloads and cut application response time in half with a modern NVMe-based SAN infrastructure.

Reduce Data Center Costs

- Minimize your data center footprint by storing up to 2PB of data in a 4U compact system.
- Save SSD storage by 5 to 10 times with inline data reduction technologies.
- Reduce power and cooling, rack space, and support costs dramatically.

Simplify IT Operations

- Unify data services across SAN and NAS environments, both on the premises and in the cloud.
- Set up and configure a complete system and serve data within 10 minutes.
- Safeguard your data with best-in-class integrated data protection and seamless cloud backup and recovery.

AFF A-Series systems, from entry-level to high-end, support end-to-end NVMe technologies, from NVMe-attached SSDs to front-end NVMe over Fibre Channel (NVMe/FC) host connectivity. These systems deliver the industry’s lowest latency for an enterprise all-flash array, making them a superior choice for driving the most demanding workloads and AI/DL applications. With a simple software upgrade to the modern NVMe/FC SAN infrastructure, you can drive more workloads with faster response times, without disruption or data migration.

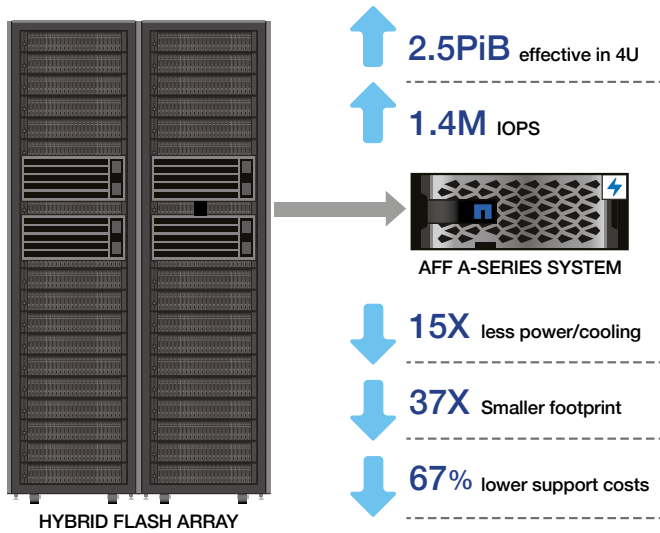


Figure 1) Benefits of Modernizing with All-Flash.

Increase Operational Efficiency for Your Business

IT departments are striving to make budgets go further and to allow IT staff to focus on new value-added projects rather than on day-to-day IT management. AFF systems simplifies IT operations therefore reduces data center cost. The newest entry-level AFF A250 systems in particular delivers best-in-class performance and efficiency at an entry price point to mid-size business customers allowing for more consolidation of workloads eliminating silos.

Provision storage in minutes

NetApp AFF systems offer broad application ecosystem support and deep integration for enterprise applications, virtual desktop infrastructure (VDI), database, and server virtualization, supporting Oracle, Microsoft SQL Server, VMware, SAP, MySQL, and more. You can quickly provision storage in less than 10 minutes with NetApp ONTAP System Manager (formerly OnCommand® System Manager).

Infrastructure management tools simplify and automate common storage tasks so that you can:

- Easily provision and rebalance workloads by monitoring clusters and nodes.
- Use one-click automation and self-service for provisioning and data protection.
- Upgrade OS and firmware with a single-click
- Import LUNs from third-party storage arrays directly into an AFF system to seamlessly migrate data.

In addition, the NetApp Active IQ® intelligence engine enables you to optimize your NetApp systems with predictive analytics and proactive support. Fueled by NetApp's massive user base, AI and machine learning create actionable insights that help you prevent problems, optimize your configuration, save time, and make smarter decisions.

Achieve storage savings, backed by the industry's most effective guarantee

NetApp employs various capabilities to promote optimal capacity savings and to drive down your TCO. AFF system's support for solid-state drives (SSDs) with multistream write technology, combined with advanced SSD partitioning, provides maximum usable capacity, regardless of the type of data that you store. Thin provisioning; NetApp Snapshot™ copies; and inline data reduction features, such as deduplication, compression, and compaction, provide substantial additional space savings—without affecting performance—enabling you to purchase the least amount of storage capacity possible. With the latest ONTAP release, AFF provides up to 33% even greater storage efficiency, so you can dramatically reduce your data center costs with the best effective capacity for any workload, backed by the industry's most effective guarantee.

Build your hybrid cloud with ease

The NetApp Data Fabric helps your organization simplify and integrate data management across cloud and on-premises to meet business demands and gain a competitive edge. With AFF, you can connect to more clouds for more data services, data tiering, caching, and disaster recovery. You can also:

- Maximize performance and reduce overall storage costs by automatically tiering cold data to the cloud with FabricPool.
- Instantly deliver data to support efficient collaboration across your hybrid cloud
- Protect your data by taking advantage of Amazon Simple Storage Service (Amazon S3) cloud resources—on premises and in the public cloud.
- Accelerate read performance for data that is shared widely throughout your organization and across hybrid cloud deployments.

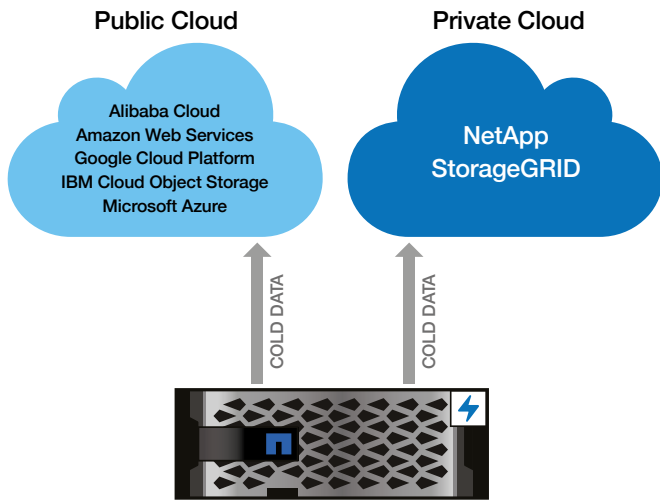


Figure 1) Benefits of Modernizing with All-Flash.

Accelerate Applications and Future-Proof Your Infrastructure

In the modern data center, IT is charged with driving maximum performance for business-critical workloads, scaling without disruption as the business grows, and enabling the business to take on new data-driven initiatives.

Get the best performance for your most demanding applications

NetApp AFF systems deliver industry-leading performance proven by SPC-1 and SPEC SFS industry benchmarks, making them ideal for demanding, highly transactional applications such as Oracle, Microsoft SQL Server, MongoDB databases, VDI, and server virtualization. With the power of front-end NVMe/FC host connectivity combined with back-end NVMe-attached SSDs, the AFF high-end AFF A800 and AFF A700 systems deliver latency as low as 100µs, making them an optimal fit for your most demanding workloads. The midrange AFF A400 system puts best performance within your budget. Its hardware acceleration technology significantly enhances performance and storage efficiency. The newest entry-level system AFF A250 provides 40% more performance and 33% more efficiency at no extra cost compared with its predecessor. You can also:

- Drive your mission-critical SAN workloads with symmetric active-active host connectivity that delivers continuous availability and instant failover.

- Consolidate workloads on AFF systems, which can deliver up to 11.4 million IOPS at 1ms latency in a cluster with a truly unified scale-out architecture. You also get built-in adaptive quality of service (QoS) that safeguards SLAs in multiworkload and multitenant environments.
- Manage massively scalable NAS containers of up to 20PB and 400 billion files with a single namespace.
- Improve the speed and productivity of collaboration across multiple locations and increase data throughput for read-intensive applications with NetApp FlexCache® software.

Modernize with advanced NVMe

Designed specifically for flash, the AFF A-Series all-flash systems deliver industry-leading performance, density, scalability, security, and network connectivity. AFF A-Series systems support NVMe/FC host connectivity on all midrange and high-end systems, so you can get twice the IOPS and cut application response time in half compared with traditional FC. These systems support a range of ecosystems, including VMware, Microsoft Windows 10, and Linux, with storage path failover. For most customers, integrating NVMe/FC into an existing SAN is a simple, nondisruptive software upgrade.

Scale without disruption

You can integrate new technologies and private or public cloud into your infrastructure nondisruptively. AFF is the only all-flash array that enables you to combine different controllers, SSD sizes, and new technologies so that your investment is protected. The newer NVMe-based AFF systems also support SAS SSDs, maximizing the flexibility and cost effectiveness of your upgrade.

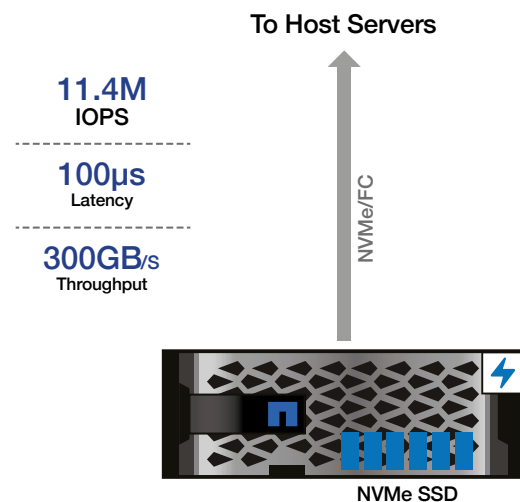


Figure 3) Industry-leading NVMe performance.

Keep Important Data Available, Protected, and Secure

As organizations become more data driven, the business impact of data loss can be increasingly dramatic—and costly. IT must protect data from both internal and external threats, ensure data availability, eliminate maintenance disruptions, and quickly recover from failures.

Integrated data protection

AFF systems come with a full suite of acclaimed NetApp integrated and application-consistent data protection software. Key capabilities include:

- Native space efficiency with cloning and NetApp Snapshot copies reduce storage costs and minimize performance impact. Up to 1,023 copies are supported.
- NetApp SnapCenter® software provides application-consistent data protection and clone management to simplify application management.
- NetApp SnapMirror® technology replicates to any NetApp FAS or AFF system on the premises or in the cloud, reducing overall system costs.

Business continuity and fast disaster recovery

With AFF, you can maintain constant data availability with zero data loss and zero downtime. NetApp MetroCluster™ software provides synchronous replication to protect your entire system, and NetApp SnapMirror Business Continuity provides a more flexible, cost-effective business continuity to even with more granular replication of selected critical data.

Security everywhere

Flexible encryption and key management help guard your sensitive data on the premises, in the cloud, and in transit. With the simple and efficient security solutions, you can:

Achieve FIPS 140-2 compliance (Level 1 and Level 2) with self-encrypting drives and use any type of drives with software-based encryption.

Meet governance, risk, and compliance requirements with security features such as secure purge; logging and auditing monitors; and write once, read many (WORM) file locking.

Protect against threats with multifactor authentication, role-based access control, secure multitenancy, and storage-level file security.

Get More Business Value with Services

Whether you are planning your next-generation data center, need specialized know-how for a major storage deployment, or want to optimize the operational efficiency of your existing infrastructure, NetApp Services and NetApp certified partners can help.

About NetApp

In a world full of generalists, NetApp is a specialist. We're focused on one thing, helping your business get the most out of your data. NetApp brings the enterprise-grade data services you rely on into the cloud, and the simple flexibility of cloud into the data center. Our industry-leading solutions work across diverse customer environments and the world's biggest public clouds. As a cloud-led, data-centric software company, only NetApp can help build your unique data fabric, simplify and connect your cloud, and securely deliver the right data, services and applications to the right people—anytime, anywhere.

Table 1) AFF technical specifications.

	AFF A800	AFF A700	AFF A400	AFF A250
Maximum scale-out	2–24 nodes (12 HA pairs)	2–24 nodes (12 HA pairs)	2–24 nodes (12 HA pairs)	2–24 nodes (12 HA pairs)
Maximum SSDs	2,880	5,760	5,760	576
Maximum effective capacity¹	316.3PB	702.7PB	702.7PB	35PB
Per-System Specifications (Active-Active Dual Controller)				
	AFF A800	AFF A700	AFF A400	AFF A250
Controller form factor	4U with 48 SSD slots	8U	4U	2U
PCIe expansion slots	8	20	10	4
FC target ports (32Gb autoranging)	32	64	24	Up to 24
FC target ports (16Gb autoranging)	32	64	32 (with FC mezzanine card)	n/a
FCoE target ports, UTA2	n/a	64	n/a	n/a
100GbE ports (40GbE autoranging)	20	24	16	4
40GbE ports (can be 4x10GbE)	n/a	32	n/a	n/a
25GbE ports (10GbE autoranging)	16	24	16	Up to 28
10GbE ports	32	64	32	n/a
10Gbase-T (1 GbE autoranging)	n/a	64	16	4
12Gb/6Gb SAS ports	n/a	64	32	4
Storage networking supported	NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB, Amazon S3	NVMe/FC, FC, FCoE, iSCSI, NFS, pNFS, SMB, Amazon S3	NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB, Amazon S3	NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB, Amazon S3
OS version	ONTAP 9.4 RC1 or later	ONTAP 9.1 RC1 or later, ONTAP 9.8 RC1 or later for NS224 support	ONTAP 9.7RC1 or later	ONTAP 9.8 RC1 or later
Shelves and media	NS224 (2U; 24 drives, 2.5" SFF NVMe); DS224C (2U; 24 drives, 2.5" SFF); DS2246 (2U; 24 drives, 2.5" SFF)	NS224 (2U; 24 drives, 2.5" SFF NVMe); DS224C (2U; 24 drives, 2.5" SFF); DS2246 (2U; 24 drives, 2.5" SFF)	NS224 (2U; 24 drives, 2.5" SFF NVMe); DS224C (2U; 24 drives, 2.5" SFF), DS2246 (2U; 24 drives, 2.5" SFF)	NS224 (2U; 24 drives, 2.5" SFF NVMe); DS224C (2U; 24 drives, 2.5" SFF); DS2246 (2U; 24 drives, 2.5" SFF)

1. Effective capacity is based on 5:1 storage efficiency ratios with the maximum number of SSDs installed. The actual ratio can be higher depending on workloads and use cases.

Table 2) AFF A Series Software

Data access protocols	<ul style="list-style-type: none"> FC, iSCSI, NVMe/FC, FCoE, NFS, SMB, Amazon S3
High availability	<ul style="list-style-type: none"> Active-active and symmetric active-active (SAN-only) host connectivity Nondisruptive maintenance, upgrade, and scale-out clustering Multisite resiliency for continuous data access
Storage efficiency	<ul style="list-style-type: none"> Inline data compression, deduplication, and compaction Space-efficient LUN, file, and volume cloning Automatic data tiering
Data management	<ul style="list-style-type: none"> Intuitive onboard GUI, REST APIs, and automation integration AI-informed predictive analytics and corrective action Quality of service (QoS) workload control Easily provision and manage data from market-leading host operating systems, hypervisors, and application software
Scalable NAS	<ul style="list-style-type: none"> Large-scale single namespace management with local and remote caching
Data protection	<ul style="list-style-type: none"> Application-consistent Snapshot copies and restore Integrated remote backup and disaster recovery Synchronous zero data loss replication
Security and compliance	<ul style="list-style-type: none"> Multifactor admin access Secure multitenant shared storage In-flight and data-at-rest encryption Regulatory-compliant data retention

