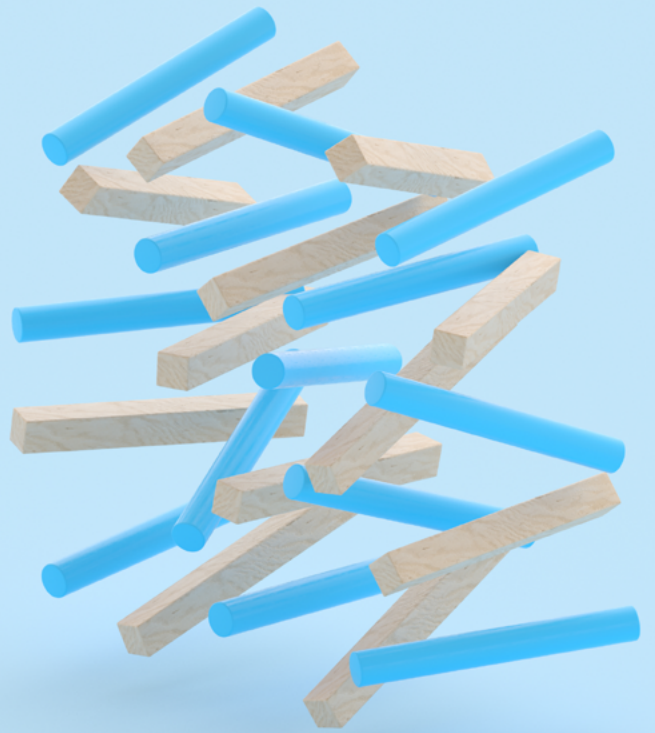DATASHEET

NetApp
AFF A-Series

Leading the future
of flash

NetApp

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 can't deliver. Additionally, more and more organizations are adopting a "cloud first" strategy, which means they need 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 transform their infrastructure more quickly and fuel data-driven strategies. Powered by NetApp ONTAP® data management software, AFF systems deliver the industry-leading 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.
- Speed up existing and emerging applications.
- Keep business-critical data available, protected, and secure.

Key benefits

Accelerate applications

- Speed up your critical applications with lightning-fast end-to-end NVMe enterprise all-flash array.
- Run artificial intelligence and machine learning applications with lowest latency.
- Support twice as many 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, whether entry-level or high-end, support end-to-end NVMe technologies, from NVMe-attached SSDs to front-end host connectivity of both NVMe over Fibre Channel (NVMe/FC) and NVMe over TCP (NVMe/TCP). These systems deliver the industry's lowest latency for an enterprise all-flash array, making them a superior choice for running the most demanding workloads and AI/DL applications. With a simple software upgrade to the modern NVMe/FC or NVMe/TCP SAN infrastructure, you can run more workloads with faster response times, without disruption or data migration.
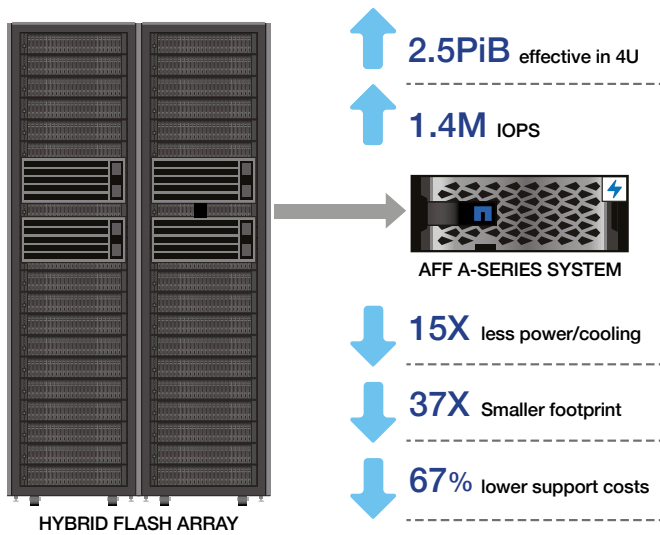
2.5PiB effective in 4U

1.4M IOPS

AFF A-SERIES SYSTEM

15X less power/cooling

37X Smaller footprint

67% lower support costs

HYBRID FLASH ARRAY

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 reduce data center cost by simplifying IT operations. The entry-level AFF A250 systems deliver best-in-class performance and efficiency to midsize business customers at low cost, helping you consolidate workloads and eliminate silos.

Provision storage in minutes

NetApp AFF systems offer broad support of application ecosystems and deep integration for enterprise applications, virtual desktop infrastructure (VDI), databases, and server virtualization. They support Oracle, Microsoft SQL Server, VMware, SAP, MySQL, and more. You can 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® Digital Advisor tool 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 industry-leading storage savings

NetApp employs various capabilities to promote optimal capacity savings and to reduce your TCO. AFF systems' support for 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.

Build your hybrid cloud with ease

When your organization builds a data fabric powered by NetApp technology, you can simplify and integrate data management across cloud and on-premises environments 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.

- Improve read performance for data that's shared widely throughout your organization and across hybrid cloud deployments.

Accelerate applications and future-proof your infrastructure

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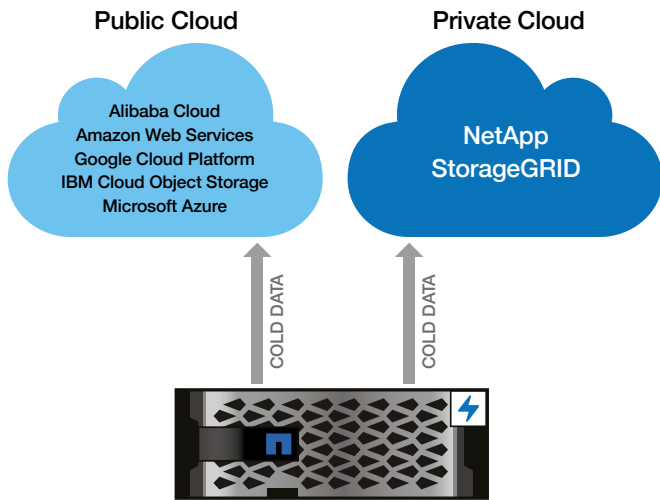
Public Cloud

Alibaba Cloud
Amazon Web Services
Google Cloud Platform
IBM Cloud Object Storage
Microsoft Azure

Private Cloud

NetApp
StorageGRID

COLD DATA

COLD DATA

Figure 2) Automatic tiering to the cloud.

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 and NVMe/TCP host connectivity combined with back-end NVMe-attached SSDs, the high-end AFF A900 system delivers 50% higher performance compared with its predecessor and latency as low as 100µs. Based on a high-resiliency design, the AFF A900 system enables in-chassis nondisruptive upgrades from its predecessor and advanced reliability, availability, and serviceability (RAS) that keep your critical data always available. It also provides all the core data management and data protection capabilities for your enterprise applications with the ONTAP Enterprise Edition software. The AFF A800 system also delivers high-end performance, but in a compact form that's especially suited for EDA and media/entertainment workloads. The midrange AFF A400 system puts outstanding performance within your budget. Its hardware acceleration technology significantly enhances performance and storage efficiency. And the 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 14.4 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, AFF A-Series all-flash systems deliver industry-leading performance, density, scalability, security, and network connectivity. As the first enterprise-grade storage systems to support both NVMe/TCP and NVMe/FC, AFF A-Series systems boost performance with modern network connectivity. With NVMe/TCP, which uses the commonly available Ethernet infrastructure, you don't have to invest in new hardware to take advantage of the faster host connectivity. With NVMe/FC, 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 and NVMe/TCP into an existing SAN is a simple, nondisruptive software upgrade.
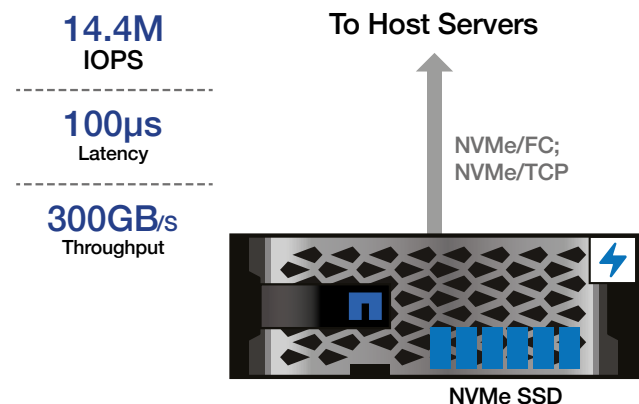
14.4M
IOPS

100µs
Latency

300GB/s
Throughput

To Host Servers

NVMe/FC;
NVMe/TCP

NVMe SSD

Figure 3) Industry-leading NVMe performance.

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.

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 the following:

- Native space efficiency with cloning and Snapshot copies reduces storage costs and minimizes 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 with even more granular replication of selected critical data.

Security everywhere

Encryption and key management help guard your sensitive data on the premises, in the cloud, and in transit. The market-leading anti-ransomware protection for both preemption and post-attack recovery safeguards your critical data from ransomware attacks and can prevent catastrophic financial consequences. 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're 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 A900	AFF A800	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	5,760	2,880	5,760	576
Maximum effective capacity[1]	702.7PB	316.3PB	702.7PB	35PB

Per-system specifications (active-active dual controller)

	AFF A900	AFF A800	AFF A400	AFF A250
Controller form factor	8U	4U with 48 SSD slots	4U	2U
PCIe expansion slots	20	8	10	4
FC target ports (32Gb autoranging)	64	32	24	16
FC target ports (16Gb autoranging)	64	32	32 (with FC mezzanine card)	n/a
FCoE target ports, UTA2	64	n/a	n/a	n/a
100GbE ports (40GbE autoranging)	32	20	16	4
25GbE ports (10GbE autoranging)	64	16	16	20
10GbE ports	64	32	32	n/a
10Gbase-T (1GbE autoranging)	64	n/a	16	4
12Gb/6Gb SAS ports	64	n/a	32	8
Storage networking supported	NVMe/TCP, NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB, Amazon S3	NFSv4/RDMA, NVMe/TCP, NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB, Amazon S3	NFSv4/RDMA, NVMe/TCP, NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB, Amazon S3	NVMe/TCP, NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB, Amazon S3
OS version	ONTAP 9.10.1 RC2 or later	ONTAP 9.7 RC1 or later	ONTAP 9.7 RC1 or later	ONTAP 9.8 RC1 or later
Shelves and media	NS224 (2U, 24 drives, SFF NVMe); DS224C (2U, 24 drives, 2.5" SFF); DS2246 (2U, 24 drives, 2.5", SFF)	NS224 (2U, 24 drives, SFF NVMe); DS224C (2U, 24 drives, 2.5" SFF); DS2246 (2U, 24 drives, 2.5", SFF)	NS224 (2U, 24 drives, SFF NVMe); DS224C (2U, 24 drives, 2.5" SFF); DS2246 (2U, 24 drives, 2.5", SFF)	NS224 (2U, 24 drives, SFF NVMe); DS224C (2U, 24 drives, 2.5" SFF)
Host/client OS supported	Microsoft Windows 2000, Windows Server 2003, Windows Server 2008, Windows Server 2012, Windows Server 2016, Linux, Oracle Solaris, AIX, HP-UX, macOS, VMware, ESX			

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	• FC, iSCSI, NVMe/FC, NVMe/TCP, FCoE, NFS, SMB, Amazon S3
High availability	• 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	• Inline data compression, deduplication, and compaction • Space-efficient LUN, file, and volume cloning • Automatic data tiering
Data management	• Intuitive onboard GUI, REST APIs, and automation integration • AI-informed predictive analytics and corrective action • QoS workload control • Easy provisioning and data management from market-leading host operating systems, hypervisors, and application software
Scalable NAS	• Large-scale single namespace management with local and remote caching
Data protection	• Application-consistent Snapshot copies and restore capabilities • Integrated remote backup and disaster recovery • Synchronous zero-data-loss replication
Security and compliance	• Automatic ransomware protection • Multifactor administrative access • Secure multitenant shared storage • In-flight and data-at-rest encryption • Regulatory-compliant data retention
Cloud integration	• Seamlessly tier, back up, replicate, and cache data to private and public clouds • Move data between major public cloud services

∏ NetApp