



Datasheet

NetApp AFF A-Series

Leading the future of flash

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.

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 All-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.

AFF A-Series systems 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.

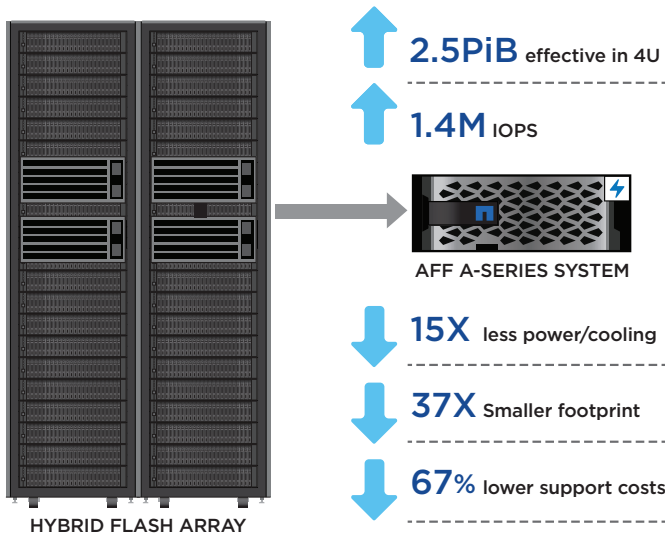


Figure 1) Benefits of Modernizing with All-Flash.

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.

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.
- 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 AFF, 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.
- Greatly simplify hybrid cloud backup and recovery with cloud-resident NetApp Data Availability Services.
- Accelerate read performance for data that is shared widely throughout your organization and across hybrid cloud deployments.

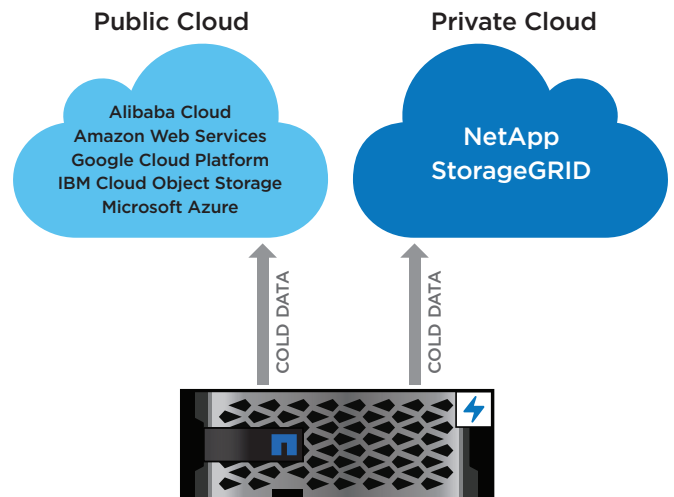


Figure 2) Automatic tiering to the cloud.

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 A800 and AFF A320 systems deliver latency as low as 100µs, making them an optimal fit for your most demanding workloads. The midrange AFF A320 system puts best performance within your budget. Supporting NVMe/RoCE connectivity on the back-end to the NVMe drive shelf and NVMe/FC on the front-end to the host, AFF A320 leads the market with the best combination of NVMe-oF technologies. You can also:

- 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.

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.

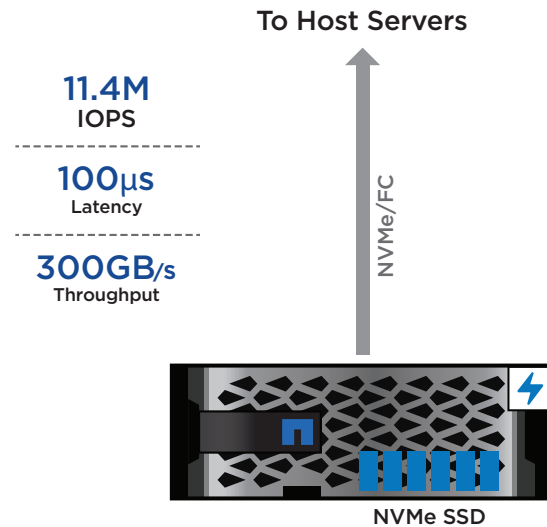


Figure 3) Industry-leading NVMe performance.

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 Synchronous provides 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

NetApp Services and NetApp Services Certified Partners collaborate with you to enhance your IT capabilities through a full portfolio of services that cover your IT lifecycle. To help you get the most value from your flash technology investment, NetApp offers:

- Assessment services to help evaluate the performance and efficiency of workloads across your heterogeneous environments.
- Advisory services to help you determine the best workload candidates to move to flash.
- Deployment and optimization services to prepare your environment and to deliver continuous operation of your AFF systems.
- Managed upgrade services to secure your storage environment and to protect your investment by ensuring your ONTAP software is the most current version.

Learn more at netapp.com/services.

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

Table 1) AFF technical specifications.

	AFF A800	AFF A700s	AFF A700	AFF A320	AFF A300	AFF A220
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)	2-24 nodes (12 HA pairs)	2-24 nodes (12 HA pairs)
Maximum SSDs	2,880	2,592	5,760	576	4,608	1,728
Maximum effective capacity ^a	316.3PB	316.3PB	702.7PB	35PB	562.2PB	193.3PB
Per-System Specifications (Active-Active Dual Controller)						
	AFF A800	AFF A700s	AFF A700	AFF A320	AFF A300	AFF A220
Controller form factor	4U with 48 SSD slots	4U with 24 SSD slots	8U	2U	3U	2U with 24 SSD slots
PCIe expansion slots	8	8	20	4	4	n/a
FC target ports (32Gb autoranging)	32	8	64	16	8	n/a
FC target ports (16Gb autoranging)	32	16	64	16	24	8
FCoE target ports, UTA2	n/a	n/a	64	n/a	24	8
100GbE ports (40GbE autoranging)	20	n/a	n/a	24	n/a	n/a
40GbE ports (10GbE autoranging)	n/a	16	32	n/a	8	n/a
10GbE ports	32	n/a	64	16	20	12
10Gbase-T (1GbE autoranging)	n/a	n/a	64	16	12	n/a
12Gb/6Gb SAS ports	n/a	16	64	n/a	24	4
Storage networking supported	NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB	NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB	NVMe/FC, FC, FCoE, iSCSI, NFS, pNFS, SMB	NVMe/FC, FC, iSCSI, NFS, pNFS, CIFS/SMB	NVMe/FC, FC, FCoE, iSCSI, NFS, pNFS, SMB	FC, FCoE, iSCSI, NFS, pNFS, SMB
OS version	ONTAP 9.4 RC1 or later	ONTAP 9.1 GA or later	ONTAP 9.1 RC1 or later	ONTAP 9.6 or later	ONTAP 9.1 RC1 or later	ONTAP 9.4 RC1 or later
Shelves and media	NVMe drive packs DS224C (2U; 24 drives, 2.5" SFF); DS2246 (2U; 24 drives, 2.5" SFF)	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)	
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, Mac OS, VMware, ESX					

a. 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

Features and software Included with ONTAP software	<p>Efficiency: NetApp FlexVol® technology, inline deduplication, inline compression, inline compaction, and thin provisioning</p> <p>Availability: active-active HA pair and multipath I/O</p> <p>Data protection: NetApp RAID DP®, RAID-TEC™, and Snapshot technology</p> <p>Whole cluster synchronous replication: NetApp MetroCluster</p> <p>Performance control: adaptive QoS and balanced placement</p> <p>Management: NetApp OnCommand Workflow Automation, ONTAP System Manager, and Active IQ Unified Manager (formerly OnCommand Unified Manager)</p> <p>Scalable NAS container: NetApp ONTAP FlexGroup</p> <p>Storage protocols supported: NVMe/FC, FC, FCoE, iSCSI, NFS, pNFS, and SMB</p>
Flash bundle	<p>NetApp SnapRestore® software: restoration of entire Snapshot copies in seconds</p> <p>NetApp SnapMirror software: simple, flexible backup and replication for disaster recovery</p> <p>NetApp FlexClone® technology: instant virtual copies of files, LUNs, and volumes</p> <p>NetApp SnapCenter®: unified, scalable platform and plug-in suite for application-consistent data protection and clone management</p> <p>NetApp SnapManager® software: application-consistent backup and recovery for enterprise applications</p> <p>For information about additional software that is available from NetApp, visit netapp.com.</p>
Extended-value software (optional)	<p>NetApp OnCommand Insight: Flexible, efficient resource management for heterogeneous environments</p> <p>NetApp SnapLock® software: compliance software for WORM protected data</p> <p>NetApp Volume Encryption (free license): granular, volume-level, data-at-rest encryption</p> <p>FabricPool: automatic data tiering to the cloud (free when tiering to NetApp StorageGRID® object-based storage)</p> <p>NetApp SnapMirror Synchronous: synchronous data replication with zero recovery point objective</p> <p>NetApp Data Availability Services: cloud-native backup solution for NetApp ONTAP storage</p> <p>NetApp FlexCache: acceleration for data access for single or multisite deployment</p> <p>For information about additional software that is available from NetApp, visit netapp.com.</p>