

ACCELERATE PERFORMANCE WITH NETAPP EF-SERIES ALL-FLASH ARRAYS



Affordable high-density, all-flash storage systems deliver consistent high performance for a wide range of specialized block workloads

The challenge

As the amount of data that organizations handle grows exponentially, they are challenged with managing more complex and costly information while balancing limited resources, space, and power. Enterprises of every size are finding that they must evolve and innovate to achieve business success and differentiate themselves from their competitors. They need to process, derive value, and gain insights from unstructured and structured data faster to speed time to market and meet customer demands.

Consistent performance and availability of key business applications that support data-intensive workloads are tightly linked to many factors such as time to market, revenue, and customer satisfaction. Therefore, enterprises need scalable solutions that improve the speed and responsiveness of these applications.

They also require solutions that deliver better business value because the cost-effectiveness of operations has become equally as important as operating without disruptions and delivering consistent high-performance.

The solution

The NetApp® EF-Series is a family of entry-level and midrange all-flash block storage arrays that can accelerate performance and data access to help you derive value faster - within budget. These systems offer end-to-end NVMe flash storage and provide sustained high IOPS at ultralow latency, response times under 100 microseconds, and write-bandwidth up to 57GB/s. They are ideal for specialized block workloads with extreme performance demands such as high-performance computing (HPC), AI (with NVIDIA DGX SuperPOD), and transactional databases.

The EF-Series is packed with enterprise-proven capabilities, including:

- Fibre Channel (FC), NVMe/RoCE, iSCSI¹, and InfiniBand (IB) support for enhanced interoperability with your existing SAN infrastructure
- Redundant components with automated failover
- Advanced monitoring and diagnostics with proactive repair
- Intuitive storage management with comprehensive tuning functions
- Full-function NetApp SANtricity[®] Web Services embedded REST API
- SANtricity Snapshot™ technology, volume copy, mirroring for data protection where supported, and Dynamic Disk Pools (DDP)
- SANtricity data assurance (T10-PI standard) for data integrity and protection against silent data inconsistency
- EF-Series Ansible collections simplify and streamline adoption by automating all storage provisioning tasks

Together, these capabilities offer an outstanding combination of capacity, performance, and price, along with configuration flexibility and simplicity, in a compact package to help you make actionable decisions faster and more securely.

Fast and affordable performance you can rely on

The EF-Series all-flash arrays offer industry-leading price, performance, rack density, and capacity in an enterprise-grade system. With support for up to 1.5PBs of flash capacity in a single modular 2U building block, the systems enable you to easily meet ever-changing business requirements. And with low TCO and a smaller physical footprint, they help achieve more cost-efficient operations.

- The EF80 all-flash array is designed specifically for workloads that demand the highest levels of performance such as AI and HPC, while the EF50 array is designed for mixed workload environments such as big data analytics and databases.
- Achieve better performance for analytics applications such as Splunk and Apache[®] Hadoop[®], reducing time to actionable data.
- Significantly improve the overall efficiency of your IT operations while meeting performance requirements.
- Speed up HPC and AI applications at scale with any of the enterprise parallel file systems that the EF-Series is integrated with, such as Lustre and BeeGFS.
- Enhance your setup with SAS enclosures, adding a tier of spinning media to complement your ultralow latency NVMe SSDs.

KEY BENEFITS

Fast

- Modular and flexible configuration options to support your most demanding performance and cost requirements
- Industry-leading IOPS and ultralow latency to increase application responsiveness

Affordable

- Industry-leading budget and performance for both high IOPS and bandwidth
- NVMe-oF and SCSI options provide investment protection to meet future demands without forklift upgrades
- Optimize rack density with up to 1.5PB in a 2U form factor

Proven

- Worry-free reliability with over 1 million installations
- Access enterprise Reliability, Availability, and Serviceability (RAS) for integrated solutions

Proven simplicity

Modular design and simple management tools make it easy to configure, manage, and scale without adding complexity.

The EF-Series runs on the enterprise-proven NetApp SANtricity OS. Optimized for flash, the SANtricity OS enables you to maximize performance through extensive configuration flexibility and custom performance tuning.

The SANtricity System Manager graphical performance tools provide key information about storage I/O from multiple viewpoints, enabling administrators to make informed decisions about configuration adjustments to further refine performance. For more performance analysis, Splunk Enterprise and Grafana solutions are available.

High availability and enterprise reliability

The NetApp EF-Series was engineered from the start to support applications that are at the heart of an organization's business. Built to provide enterprise reliability in both the architecture and the software design, the EF-Series leverages expertise based on more than 20 years of development experience and more than 1 million implemented systems. Fully redundant I/O paths, advanced data protection features, and extensive diagnostic capabilities allow the EF-Series to achieve greater than 99.9999% availability with data integrity and security.

Secure data, secure management

NetApp SANtricity drive encryption combines key management with drive-level encryption. This combination creates comprehensive security for data at rest with no impact to performance. Because all drives eventually leave the data center through redeployment, retirement, or service, you can be assured that your sensitive data is not leaving with them. You can choose to manage the drive authentication keys natively for a simple, low-cost solution or use a KMIP-compliant external key manager for centralized administration. Management access to the EF-Series is protected with role-based access control (RBAC) and LDAP/Active Directory integration.

Advanced data protection

SANtricity Dynamic Disk Pools (DDP) technology enables storage administrators to simplify RAID management, improve data protection, and maintain predictable performance under every condition. DDP technology evenly distributes data, protection information, and spare capacity across the drives, simplifying setup and maximizing use. This innovative technology minimizes the performance impact of a drive failure and can return the system to optimal condition up to 8 times faster than traditional RAID. With shorter rebuild times and exclusive technology to prioritize critical reconstruction, DDP significantly reduces exposure to multiple failures, offering a level of data protection that simply cannot be achieved with traditional RAID.

With the SANtricity OS, all management tasks can be performed while the storage remains online with complete read/write data access. Storage administrators can make configuration changes, conduct maintenance, and expand storage capacity without disrupting I/O to attached hosts.

SANtricity OS online capabilities include:

- Dynamic capacity and volume expansion enable administrators to increase the capacity of an existing pool, volume group, or volume.
- Dynamic segment size migration enables administrators to change the segment size of a given volume.
- Dynamic RAID-level migration changes the level of a RAID group on the existing drives without requiring the relocation of data. Supported RAID levels are 0, 1, 5, 6, and 10.
- All software/firmware updates (controller, drive) are nondisruptive, with no interruption to data access.

Administrators can use the SANtricity remote storage feature to perform online import of remote volumes over iSCSI.



Validated solution reference designs

With tested solution designs for high-transaction databases, AI with NVIDIA DGX SuperPOD², and real-time analytics using Splunk, your demanding business applications with large throughput requirements built on EF-Series systems will consistently deliver high performance. You can focus on growing your business instead of worrying about your data infrastructure.

ASHRAE compliance

All EF-Series systems meet the certification requirements of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, a global society that advances human well-being through sustainable technology for the built environment. All EF-Series models are ASHRAE A4 compliant.

¹ At launch, iSCSI is not supported by EF50 and EF80.

² New systems are pending NVIDIA DGX SuperPOD certification.

▶ 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 Professional Services](#) and [NetApp Certified Partners](#) can help.

Table 1. NetApp EF-Series technical specifications

	EF80	EF50	EF600	EF600C	EF300	EF300C
Controller chassis form factor^[1]	2U; 24 internal NVMe SSD slots	2U; 24 internal NVMe SSD slots	2U; 24 internal NVMe SSD slots	2U; 24 internal NVMe SSD slots	2U; 24 internal NVMe SSD slots	2U; 24 internal NVMe SSD slots
SAS Expansion shelves	N/A	N/A	Hybrid: 4U with 60 slots and 2U with 12 slots; All-flash: 2U with 24 SAS SSD slots	N/A	Hybrid: 4U with 60 slots and 2U with 12 slots; All-flash: 2U with 24 SAS SSD slots	N/A
Controller memory	64GB	32GB	32GB, 128GB	32GB, 128GB	16GB	16GB
Maximum SSDs (NVMe)	24	24	24	24	24	24
Maximum raw capacity in base system	1.5PB	1.5PB	367TB	1.5PB	367TB	1.5PB
Maximum raw capacity with expansion	1.5PB	1.5PB	9.6PB hybrid, or 1.8PB all-SSD	1.5PB	5.7PB hybrid, or 1.8PB all-SSD	1.5PB
Maximum IOPS	Up to 5,000,000	Up to 1,700,000	Up to 2,000,000	Up to 1,000,000	Up to 670,000	Up to 350,000
Maximum read bandwidth^[2]	110GBps	41GBps	44GBps	44GBps	20GBps	20GBps
Maximum write bandwidth^[2]	57GBps	30GBps	13GBps	13GBps	7GBps	7GBps
Power consumption	Typical: 1235W Max: 1758W	Typical: 1041W Max: 1451W	Typical: 979W Max: 1128W	Typical: 979W Max: 1128W	Typical: 643W Max: 870W	Typical: 643W Max: 870W
IO connectivity per array	12 ports 200Gb NVMe/IB, NVMe/RoCE 24 ports 64Gb NVMe/FC 24 ports 64Gb SCSI FC	16 ports 64Gb NVMe/FC 16 ports 64Gb SCSI FC	4 ports 200Gb NVMe/IB, NVMe/RoCE 4 ports 200Gb iSER/IB 8 ports 100Gb NVMe/IB, NVMe. RoCE 8 ports 100Gb iSER/IB, SRP/IB 16 ports 32 Gb NVMe/FC 16 ports 32Gb SCSI FC 16 ports 25Gb iSCSI	4 ports 200Gb NVMe/IB, NVMe/RoCE 4 ports 200Gb iSER/IB 8 ports 100Gb NVMe/IB, NVMe. RoCE 8 ports 100Gb iSER/IB, SRP/IB 16 ports 32 Gb NVMe/FC 16 ports 32Gb SCSI FC 16 ports 25Gb iSCSI	4 ports 100Gb NVMe/IB, NVMe/RoCE 4 ports 100Gb iSER/IB, SRP/IB 8 ports 32 Gb NVMe/FC 8 ports 32Gb SCSI FC 8 ports 25Gb iSCSI	4 ports 100Gb NVMe/IB, NVMe/RoCE 4 ports 100Gb iSER/IB, SRP/IB 8 ports 32 Gb NVMe/FC 8 ports 32Gb SCSI FC 8 ports 25Gb iSCSI
Storage networking supported	NVMe/IB, NVMe/RoCE, NVMe/FC, FC	NVMe/FC, FC	NVMe/IB, iSER/IB, SRP/IB, NVMe/RoCE, NVMe/FC, FC, iSCSI	NVMe/IB, iSER/IB, SRP/IB, NVMe/RoCE, NVMe/FC, FC, iSCSI	NVMe/IB, iSER/IB, SRP/IB, NVMe/RoCE, NVMe/FC, FC, iSCSI	NVMe/IB, iSER/IB, SRP/IB, NVMe/RoCE, NVMe/FC, FC, iSCSI
OS version	SANtricity OS 12.0 or later	SANtricity OS 12.0 or later	SANtricity OS 11.70R1 or later	SANtricity OS 11.90 GA or later	SANtricity OS 11.70R1 or later	SANtricity OS 11.90 GA or later

	EF80	EF50	EF600	EF600C	EF300	EF300C
Shelves and media			DE212C (2U, 12 drives, 3.5" NL-SAS and 2.5" SAS); DE224C (2U, 24 drives, 2.5" SAS); DE460C (4U, 60 drive, 3.5" NL-SAS and 2.5" SAS)		DE212C (2U, 12 drives, 3.5" NL-SAS and 2.5" SAS); DE224C (2U, 24 drives, 2.5" SAS); DE460C (4U, 60 drive, 3.5" NL-SAS and 2.5" SAS)	
Host/Client OS supported	Windows Server, Linux, MacOS, VMware					

¹ The base system can be configured with minimum of SSDs. See the expansion options later in this table.

² Peak system performance. Performance varies based on workload, protocol, connectivity, and media type.

Table 2. EF-Series software: SANtricity System Manager (web-based, on-box)

High availability	<ul style="list-style-type: none"> • Dual active controller with automated I/O path failover • Automatic Load Balancing and path connectivity monitoring • DDP technology and traditional RAID levels • Redundant, hot-swappable storage controllers, disks, power supply units (PSUs), fans • Automatic rebuild after a drive failure • Mirrored data cache with battery-backed destaging to flash • Proactive drive health monitoring • Online upgrades and maintenance for software and firmware • Online configuration, expansion, contraction, and tuning • Data assurance (T10 PI ANSI standard for data integrity) • NetApp Active IQ • Six-nines availability (with appropriate configuration and service plans)
Data management	<ul style="list-style-type: none"> • Remote storage online volume import (iSCSI) • Dynamic Disk Pools technology and traditional RAID levels 0, 1, 5, 6, and 10 • On-box SANtricity System Manager • On-box SANtricity Web Services API • SANtricity Unified Manager for enterprise management • Smart NVMe SSD performance and endurance management • SANtricity SSD read cache
Data protection	<ul style="list-style-type: none"> • SANtricity Snapshot copy • SANtricity asynchronous mirroring (EF300, EF300C, EF600, and EF600C only)
Security and compliance	<ul style="list-style-type: none"> • RBAC with audit log • LDAP/LDAPS for user authentication • Digital certificate management • Multifactor authentication (MFA) supported through SAML 2.0 • Internal key management supported with self-encrypting drive (SED) or FIPS drives • External key management (KMIP-compliant) supported with SED or FIPS drives • Transport Layer Security (TLS) 1.2 minimum for all management communication • SANtricity drive security data at rest encryption¹

¹ Hardware and software for at-rest data encryption are not available in certain countries, including Russia, Belarus, Kazakhstan, and other Eurasian Customs Union countries.



Contact Us

About NetApp

For more than three decades, NetApp has helped the world's leading organizations navigate change – from the rise of enterprise storage to the intelligent era defined by data and AI. Today, NetApp is the Intelligent Data Infrastructure company, helping customers turn data into a catalyst for innovation, resilience, and growth. At the heart of that infrastructure is the NetApp data platform – the unified, enterprise-grade, intelligent foundation that connects, protects, and activates data across every cloud, workload, and environment. Built on the proven power of NetApp ONTAP, our leading data management software and OS, and enhanced by automation through the AI Data Engine and AFX, it delivers observability, resilience, and intelligence at scale. Disaggregated by design, the NetApp data platform separates storage, services, and control so enterprises can modernize faster, scale efficiently, and innovate without lock-in. As the only enterprise storage platform natively embedded in the world's largest clouds, it gives organizations the freedom to run any workload anywhere with consistent performance, governance, and protection. With NetApp, data is always ready – ready to defend against threats, ready to power AI, and ready to drive the next breakthrough. That's why the world's most forward-thinking enterprises trust NetApp to turn intelligence into advantage.

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