



NetApp®



Solution Brief

NetApp EF540 Flash Array

Extreme IOPS and submillisecond latency for performance-critical workloads

KEY BENEFITS

Extreme Performance

Over 300,000 IOPS and submillisecond latency let you finish business operations faster and improve customer experience.

Maximum Efficiency

Eliminates overprovisioning and dramatically reduces costs by cutting space utilization, power, and cooling by up to 95%.

Leading Availability

Fully redundant system with automated failover and advanced monitoring to maximize uptime.

Advanced Data Recovery

Snapshot™ copies and remote replication to full-flash, hybrid, or spinning disk storage enable industry-leading recovery options and cost flexibility.

Enterprise-Proven Platform

Leveraging experience from 500,000 systems, flash-optimized EF540 is designed to work in the most demanding environments.

The Challenge

Increasingly, corporations are looking for ways to drive greater speed and responsiveness from the applications that control their key business operations, especially database systems. Because the performance of these applications is tightly linked to time to market, revenue, and customer satisfaction, it is critical they operate at maximum potential.

To achieve extreme performance, organizations might have had to overprovision capacity, deploying partially filled disks that allow the storage to meet the needed performance but waste disk capacity, data center space and power. To eliminate overprovisioning and maximize return on investment from high-performance applications, companies are now looking to all-flash systems. But as buyers consider these new systems, they are often challenged to find an offering that is also enterprise proven and highly reliable.

The Solution

The NetApp® EF540 Flash Array is an all-SSD storage system designed specifically for database-driven business operations demanding the highest levels of performance, reliability, and

availability. Requiring just 2U of rack space, the EF540 Flash Array combines extreme IOPS, submillisecond response times, and over 6GBps of bandwidth with leading, enterprise-proven availability features including:

- Redundant components with automated failover
- Intuitive storage management with comprehensive tuning functions
- Advanced monitoring and diagnostics with proactive repair
- Snapshot copies and replication for subsecond backup and long-distance recovery

Combined, these capabilities enable the EF540 Flash Array to improve the speed of business as well as the overall efficiency and reliability of IT operations. This win for both the business and IT translates to a better overall experience for both you and your customers.

Extreme Performance

The EF540 Flash Array continues NetApp's longstanding heritage of delivering powerful solutions to meet unique business needs. Designed specifically for customers with high-speed, transactional applications that demand high IOPS and low latency,

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the EF540 Flash Array delivers over 300,000 sustained IOPS and submillisecond response times. Bandwidth-oriented workloads will also benefit from the EF540's ability to deliver 6GBps of throughput.

The all-flash design is built in a 2U enclosure and delivers the performance of over a thousand 15,000 RPM drives while requiring just 5% of the rack space, power, and cooling. This up to 95% reduction in space and power consumption allows the EF540 Flash Array to significantly improve the overall efficiency of IT operations while continuing to meet performance requirements from business operations.

High Availability and Enterprise Reliability

Because the applications that the EF540 Flash Array is designed to support are often the heart of a corporation's business processes, the EF540 has been built with enterprise reliability in mind. The EF540 Flash Array leverages lessons learned across 500,000 system installations to provide enterprise reliability and fault tolerance, in both the architecture and the system code.

To allow recovery in the event of an environment issue or component failure, the EF540 Flash Array includes fully redundant I/O paths with automated failover, extensive diagnostic capabilities that alert on and help resolve failures, and advanced data protection

features. All management tasks are performed while the storage remains online with complete read/write data access. This allows storage administrators to make configuration changes and conduct maintenance without disrupting application I/O.

As IT staff knows, one of the most critical aspects of an enterprise solution is the ability to detect and resolve issues. In this area, the EF540 Flash Array provides significant depth of capabilities:

- Extensive capturing and monitoring of diagnostic data provides comprehensive fault isolation and simplify analysis of unanticipated events.
- Proactively tracks SSD wear life and alerts when threshold is reached
- Integrated Recovery Guru diagnoses problems and provides the applicable procedure to use for recovery.
- Background media scan identifies parity inconsistencies, rewrites sectors that might not have been properly written, and reallocates defective sectors.
- “Lost” data can be recreated on the fly using redundancy.
- A drive rebuild can continue even when encountering an unreadable sector (patented).

Advanced Data Protection

The EF540 Flash Array offers advanced data protection common to enterprise storage to protect against data loss and downtime events, both locally and over long distance. These features include:

- **Snapshot copies.** Create and restore point-in-time copies of datasets in under a second to protect against accidental data loss on the local array.
- **Synchronous replication.** Create a zero-data-loss copy of databases and other high-performance application content on another array to quickly continue operations in the event of a site-level outage or array-level event.
- **Asynchronous replication.** Provide long-distance disaster recovery to a remote site or colocation facility to enable your business operations to continue running no matter what happens.

Unique to the EF540 Flash Array is the ability to replicate data to either an EF540 or a NetApp E-Series system. This capability allows you the choice of creating a high-speed, low-latency recovery system that will run at the same speed as your production operations and/or fail over to a consolidated E-Series system with more cost-effective disk storage. This flexibility in design allows you to choose the profile of performance and cost unique to your business.

Simple, Robust Management

The EF540 Flash Array runs on the enterprise-proven SANtricity® software platform. Optimized for flash, SANtricity software allows storage administrators to achieve maximum performance and utilization of their EF540 through extensive

configuration flexibility, custom performance tuning, and complete control over data placement. Its graphically based performance tools provide key information on storage I/O from multiple viewpoints, allowing administrators to make informed decisions on configuration adjustments to further refine performance. And with its dynamic capabilities, SANtricity software supports on-the-fly expansion, reconfigurations, and maintenance without interrupting storage system I/O, including:

- Dynamic capacity expansion (DCE) and dynamic volume expansion (DVE) features let you expand capacity so maximum performance and utilization are assured.
- Dynamic RAID-level migration (DRM) changes the RAID level of a RAID group on the existing drives, without requiring the relocation of data. Supported RAID levels are 0, 1, 3, 5, 6, and 10.
- Nondisruptive controller firmware upgrades (no interruption to data access) are supported.

Professional Services

Modular Offerings Customized for You

NetApp Professional Services can assist you in any and every phase of the storage lifecycle. Whether you need help planning your next-generation storage system, need an extra set of hands for a major storage deployment, or want to upgrade your existing infra-

structure, NetApp Professional Services personnel have the skills and expertise. NetApp offers a complete portfolio of services. In summary, NetApp Professional Services offerings include:

- **Solution suites.** These customized solutions are designed to address your business-level challenges holistically.
- **Assessment services.** Enlist NetApp to identify and document business, storage, and infrastructure requirements and receive recommendations for improvements.
- **Consulting services.** Reduce the complexity of your networked storage implementation when you enlist our experts to design, document, and implement a range of applications and solutions.
- **Deployment/implementation services.** Reduce risk as we prepare your site, install and connect systems, set up your software, and perform complete verification.
- **Managed services.** Have NetApp experts on site to perform storage management services so you can focus on core business initiatives.

Global Support

SupportEdge services

NetApp Global Support delivers the highest availability for your enterprise data environment and helps you optimize your storage investments. Let NetApp mitigate support issues and drive operational best practices. NetApp's innovative, proactive support

means you'll have fewer and less-severe support cases. But if a problem arises, our award-winning technical centers and field support staff—delivering in over 100 countries—won't rest until it's solved.

As an industry leader in innovation, NetApp Global Support provides tools and technology to enable business continuity. AutoSupport™, NetApp's suite of automation tools, is delivered as a service to help you proactively manage your systems and quickly resolve issues. AutoSupport functions as a "virtual staff" to protect critical data, save time, and reduce impact on your IT resources.

About NetApp

NetApp creates innovative storage and data management solutions that deliver outstanding cost efficiency and accelerate business breakthroughs. Discover our passion for helping companies around the world go further, faster at www.netapp.com.

Go further, faster*

For More Information

- **NetApp EF540:** www.netapp.com/us/products/storage-systems/ef540/
- **Additional products and software:** www.netapp.com/us/products/
- **Professional Services:** www.netapp.com/us/services/professional/
- **Support:** www.netapp.com/us/support/

TECHNICAL SPECIFICATONS

All data in this table applies to dual-controller configurations.

ATTRIBUTE	NETAPP EF540 FLASH ARRAY
Disk drives	12 or 24
Raw capacity	9.6TB or 19.2TB
Drive types supported	2.5" SSD 800GB
Form factor	2U/24
Memory	24GB
Base I/O interfaces	(8) 8Gb FC
I/O interface expansion options	(8) 8Gb FC, (8) 6Gb SAS, (4) 10Gb iSCSI, (4) 40Gb InfiniBand
OS version	SANtricity 10.84
High-availability features	<ul style="list-style-type: none">• Dual active controller with automated I/O path failover• RAID levels 0, 1, 3, 5, 6, and 10• Redundant, hot-swappable controllers, disk drives, power supplies, and cooling fans• Automatic drive failover and detection and rebuild using global hot spare drives• Mirrored data cache with battery backup and destage to memory• Nondisruptive controller firmware upgrades (no interruption to data access)• SANtricity proactive drive health monitoring identifies problem drives before they create issues• SANtricity persistent monitor makes periodic copies of the storage system configuration
Operating systems supported	Microsoft® Windows Server®, Red Hat Enterprise Linux®, Novell SUSE Linux Enterprise Server, VMware® ESX®, Oracle® Solaris, HP HP-UX, Apple® Mac® OS
Software features	<p>Standard</p> <p>Dynamic volume expansion, dynamic capacity expansion, dynamic RAID-level migration, dynamic segment size migration, persistent monitor, proactive drive health monitoring, nondisruptive firmware upgrades, background media scan with autoparity check and correction</p> <p>Optional</p> <p>SANtricity Snapshot, SANtricity remote mirroring</p>
DIMENSIONS AND WEIGHT	
Height	3.47" (8.81 cm)
Width	19" (48.26 cm)
Depth	19.6" (49.78 cm)
Weight	53 lb (24 kg)
MAX POWER AND COOLING	
KVA	0.39
Watts	386
BTU	1,316



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