

DATASHEET

NetApp E-Series SANtricity Software

Software building blocks to
enable a fast, simple, reliable
storage infrastructure



The challenge

Your enterprise relies on core applications that are crucial to your success. To achieve organizational goals, you need consistent application performance and continuous availability. You need storage systems that you can set up quickly and manage easily. And they need to work flawlessly with your application software. Because your operations depend on these applications, they must have greater than 99.999% availability. To meet these requirements, you need proven enterprise-grade storage and software.

The solution

Create a storage infrastructure that is fast, simple, and reliable. The NetApp® SANtricity® OS flexibly delivers performance for a wide variety of workloads while keeping data secure and available. NetApp E-Series systems and SANtricity software make it easy, thanks to industry-leading performance, reliability, and simplicity of administration.

SANtricity OS

With the SANtricity OS, you can perform all your management tasks while the storage remains online, with complete read and write data access. This capability means that storage administrators can make configuration changes, perform maintenance, and expand storage capacity without scheduling downtime.

These online capabilities include the following:

- Nondisruptive controller firmware and drive firmware upgrades mean no scheduled downtime.
- NetApp Dynamic Disk Pools (DDP) technology greatly simplifies traditional storage management with no idle spares to manage or reconfigure when drives are added or when they fail. This capability enables automatic configuration, expansion, and scaling of storage.
- DDP dynamic capacity expansion and reduction enable administrators to add or remove as many as 60 drives at a time for a pool. The pool dynamically rebalances to adjust for these drive count changes, with no need to recalculate parity.
- Dynamic physical and logical expansion enable administrators to add new drive modules and create new pools, volume groups, and volumes, without disrupting access to existing data.

Key benefits

SANtricity OS: Optimized for performance and reliability

- Accelerate performance for high-IOPS and low-latency applications and for high-bandwidth and high-throughput applications.
- Get best-in-class reliability with automated failover, online configuration and maintenance, state-of-the-art data integrity, and proactive monitoring.

SANtricity System Manager: Web based and easy to use

- Simplify storage management with this intuitive, on-box, web-based interface.
- Gain flexibility with online administration, mixed workload configurations, and advanced tuning.

SANtricity Unified Manager: Web-based, scalable enterprise management

- Discover, organize, and manage as many as 500 systems with a simple web-based interface.
- Manage NetApp E2800, EF280, E5700, EF570, EF600, and EF300 systems.

SANtricity Web Services: RESTful API

- Full-function API for orchestration and automation needs.

- Dynamic volume expansion (DVE) enables administrators to expand the capacity of an existing volume by using the free capacity in the volume group or pool. DVE redistributes or rebalances for maximum performance and utilization.
- Dynamic RAID-level migration changes the RAID level of a volume group on the existing drives without requiring the relocation of data. The migration operation supports RAID levels 0, 1, 5, 6, and 10. Dynamic segment size migration can also be supported on RAID volumes.
- Dynamic capacity expansion for volume groups allows you to add up to two drives at a time to an existing volume group. This capability introduces free capacity for volume creation or expansion and improves the performance of the member volumes.
- Online priority adjustment of background operations allows you to fine-tune the performance of critical volumes.

High availability

When data is trusted to a storage system, accessing and protecting that information 24/7 is crucial to your organization's future. SANtricity OS and E-Series hardware exceed 99.999% availability, going beyond basic high-availability features to significantly improve data access and data integrity. I/O path management and automatic load balancing of the workload on the controllers, paired with proactive background monitoring, mean that data is available when you need it. Data assurance verifies data integrity from the controller to the drive in conformance with the T10 PI standard.

DDP technology significantly lowers data exposure during drive failure by reconstructing data much faster while protecting performance. DDP's patented prioritized reconstruction along with the shorter rebuild times greatly reduce risk of downtime. SANtricity is designed for operations in the real world, where applications must continue to deliver value.

Data protection

SANtricity drive encryption services offer comprehensive security for data at rest on the drive without affecting storage system performance or ease of use. E-Series uses self-encrypting drives (SEDs) including options for FIPS 140-2 level 2 mode. Encrypted drives provide data security for events such as a drive being stolen, returned for service, or repurposed. You can manage the drive authentication keys natively for a simple, lowest-cost solution, or use a KMIP-compliant external key manager for centralized administration.

NetApp SANtricity Snapshot™ copies are point-in-time images, or logical copies, of a storage volume. This feature enables secondary servers to access an optionally writable version of a volume for things like backup, file restoration, application testing, or data mining. Remote mirroring (where supported) protects information by replicating local data volumes to a remote storage system. This robust functionality includes suspend and resume with delta resynchronization, mirror groups for multivolume consistency, and the ability to create a Snapshot copy of the remote data while the mirror remains active. Also, support for cross-mirroring enables two separate systems to function as remote disaster recovery sites. The flexibility of Fibre Channel (FC) or IP-based asynchronous mirroring or FC-based synchronous mirroring enables data protection for almost any environment.

SANtricity management software unlocks the power of the SANtricity OS

Every environment is different, with varying priorities for performance, data availability, and capacity utilization. Whether you're managing a hybrid system, all spinning media, or all flash, the SANtricity OS can meet your application needs. This flexibility results in optimal performance, more efficient use, and lower storage costs.

With the SANtricity OS and System Manager, you can create up to 512 heterogeneous hosts or clusters of hosts from a single E-Series storage system. DDP and RAID volume groups can coexist in the storage system. This flexibility allows a range of hosts with different OS, capacity, performance, and data protection requirements to share a single E-Series storage system. More management options are available through the SANtricity CLI and on-box SANtricity Web Services REST API.

SANtricity System Manager: Straightforward, on-box management

SANtricity System Manager lets you log in to an individual E2800, EF280, E5700, EF570, EF600, or EF300 system from various web browsers and manage your storage through an easy-to-use, on-box web interface. Intuitive workflow wizards and context-sensitive online help streamline configuration tasks. The software suggests configuration candidates that take advantage of hardware capabilities such as drawer loss protection on dense enclosures, and smart management of wear life and performance on SSDs. Sophisticated performance monitoring lets you view information from the system level down to individual drives or export the performance data for further analysis. Tuning activities such as managing the SSD cache or data cache are all online. When a repair becomes necessary, the SANtricity Recovery Guru provides step-by-step instructions.

Security capabilities

SANtricity System Manager management security features include:

- Role-based access control and audit log
- Management of digital certificates (import, export, certificate signing request)
- Ability to set up a Lightweight Directory Access Protocol (LDAP or LDAPS) server for user authentication
- Support multifactor authentication through SAML 2.0
- Common Criteria certified
- All management communications are encrypted (TLS 1.2, 1.3)

NetApp Active IQ and event monitoring

The NetApp Active IQ[®] tool enhances customer service, speeds problem resolution, and helps prevent issues before they affect your business. Fueled by telemetry data from E-Series systems around the globe, Active IQ uses machine learning and predictive analytics to identify security risks and offer corrective actions to protect your E-Series system. You can access data-driven insights and recommendations through a web UI, a mobile app, and an API. SANtricity System Manager can also be configured for email alerts and SNMP traps.

SANtricity Unified Manager: Scalable, web-based management for current E-Series storage systems

SANtricity Unified Manager offers a highly scalable enterprise view for up to 500 E2800, EF280, E5700, EF570, EF600, and EF300 systems. From a single window, you can view status, organize arrays into groups, update the SANtricity OS for multiple arrays, and launch the on-box SANtricity System Manager for each array. With SANtricity Unified Manager, you can quickly configure alerts and other settings to multiple arrays with a single operation. SANtricity Unified Manager is installed on a Linux or Windows management server and runs in a browser.

SANtricity APIs: Options for orchestration and adding value

SANtricity Web Services is a full-featured REST API embedded on E-Series systems. It's the interface used by SANtricity System Manager and (in proxy form) by SANtricity Unified Manager. SANtricity Web Services enables you to create your own DevOps solutions, and it powers these solutions:

- NetApp E-Series Performance Analyzer (for Grafana)
- Ansible role and module-based automation
- NetApp SANtricity Performance App for Splunk Enterprise

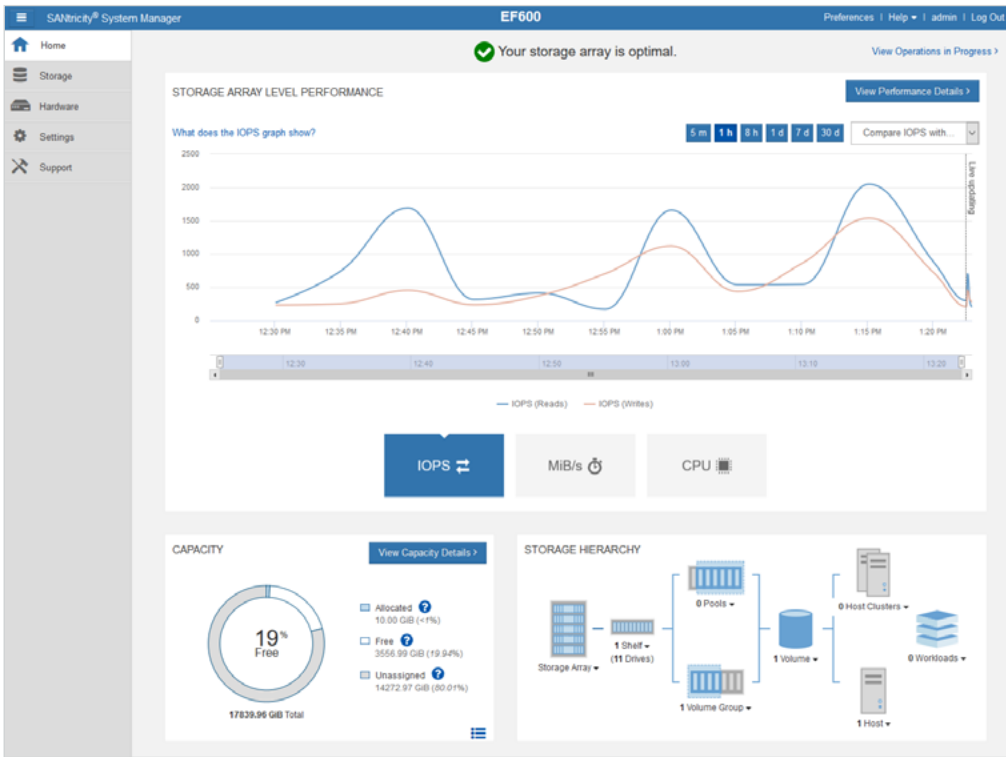
SANtricity Storage Manager: Enterprise management for legacy and current E-Series storage systems

If you have a mix of older and newer E-Series systems, SANtricity Storage Manager is the way to see an enterprise view. You can discover legacy E-Series storage systems as well as E2800, EF280, E5700, EF570, EF600, and EF300 systems. From a single console, you can view status and launch the appropriate management application for the storage system.

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.



1) The SANtricity System Manager dashboard offers at-a-glance status for a single storage array. System Manager has extensive online help and well-organized task areas to help you administer, update, tune, and monitor your storage system.

The screenshot shows the 'MANAGE - LabM' view in SANtricity Unified Manager. It features a table of storage arrays with the following columns: Storage Array, Status, Model Name, and IP Address. The table contains 11 rows of data. The first row shows a storage array with status 'Offline'. The remaining 10 rows show storage arrays with status 'Optimal' and model name '5700'. The IP Address column contains multiple IP addresses for each array, indicating a multi-homed configuration. Below the table, it shows 'Selected rows: 0 of 11'.

Storage Array	Status	Model Name	IP Address
ICTM0818502C01	Offline	5700	10.113.93.177, 10.113.93.178, ICTM0818502C01-A.ict.englab.netapp.com, ICTM0818502...
ICTM0817502C01	Optimal	5700	10.113.94.67, 10.113.94.68, ICTM0817502C01-A.ict.englab.netapp.com, ICTM0817502C0...
ICTM0817504C01	Optimal	5700	10.113.94.45, 10.113.94.46, ICTM0817504C01-A.ict.englab.netapp.com, ICTM0817504C0...
ICTM0818503C01	Optimal	5700	10.113.93.182, 10.113.93.183, ICTM0818503C01-A.ict.englab.netapp.com, ICTM0818503...
ICTM0820502C01	Optimal	5700	10.113.94.10, 10.113.94.11, ICTM0820502C01-A.ict.englab.netapp.com, ICTM0820502C0...
ICTM0820503C01	Optimal	5700	10.113.94.13, 10.113.94.14, ICTM0820503C01-A.ict.englab.netapp.com, ICTM0820503C0...
ICTM0820504C01	Optimal	5700	10.113.94.16, 10.113.94.17, ICTM0820504C01-A.ict.englab.netapp.com, ICTM0820504C0...
ICTM0820505C01	Optimal	5700	10.113.94.19, 10.113.94.20, ICTM0820505C01-A.ict.englab.netapp.com, ICTM0820505C0...
ICTM0820506C1	Optimal	5700	10.113.94.54, 10.113.94.55, ICTM0820506C1-A.ict.englab.netapp.com, ICTM0820506C1-...
ICTM0822502C01	Optimal	5700	10.113.94.63, 10.113.94.64, ICTM0822502C01-A.ict.englab.netapp.com, ICTM0822502C0...
ICTM0822503C01	Optimal	5700	10.113.94.66, 10.113.94.67, ICTM0822503C01-A.ict.englab.netapp.com, ICTM0822503C0...

2) SANtricity Unified Manager provides scalable management for up to 500 storage arrays, with support for mass operations such as SANtricity OS updates and setting up Active IQ reporting.

