Get started

E-Series

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Get started

What this site includes

This site includes information for specific E-Series releases, models, and components.

What's included	What's *not* included
This site includes information for the following releases and component types: • **SANtricity software** — version 11.50 and later. • **Controller firmware** — version 8.50 and later. • **Controller types** — All E2800, EF280, EF300, E5700, EF570, and EF600 models. • **Interface types** — Fibre Channel, iSCSI, iSER, SAS, and NVMe. • **Operating systems installed on hosts** — Linux, VMware, and Windows. Additional interfaces and operating systems might be supported. For more information, contact technical support.	This site does *not* include information for releases *earlier than* software version 11.50 or firmware version 8.50. For earlier releases, go to the E-Series and SANtricity Document Resources page. For information on your site preparation requirements, go to NetApp Hardware Universe.

Learn about E-Series systems

E-Series terminology

Learn more about the terms used in E-Series.

Term	Description
controller	A controller consists of a board, firmware, and software. It controls the drives and implements the functions.
duplex/simplex configurations	Duplex is a two-controller module configuration within the storage array. Simplex is a single-controller module configuration.
HDD	Hard disk drives (HDDs) are data storage devices that use rotating metal platters with a magnetic coating.

Term	Description
HIC	A host interface card (HIC) connects the array to the host. It can optionally be installed within a controller canister.
IB	InfiniBand (IB) is a communications standard for data transmission between high-performance servers and storage systems.
IOPS	IOPS is input/output operations per second.
mirroring	Mirroring is the replication of data volumes onto separate storage arrays to ensure continuous availability.
pool	A pool is a set of drives that is logically grouped. You can use a pool to create one or more volumes accessible to a host.
power/fan canister	A power/fan canister is an assembly that slides into a shelf. It includes a power supply and an integrated fan.
rack unit (U)	A rack unit (abbreviated U) is a unit of measure defined as 44.50 millimetres (1.75 in).
SAS	Serial Attached SCSI (SAS) is a point-to-point serial protocol that links controllers directly to disk drives.
RoCE	RDMA over Converged Ethernet (RoCE) is a network protocol that allows remote direct memory access (RDMA) over an Ethernet network.
shelf	A shelf is an enclosure installed in a cabinet or rack. It contains the hardware components for the storage array. There are two types of shelves: a controller shelf and a drive shelf. A controller shelf includes controllers and drives. A drive shelf includes input/output modules (IOMs) and drives.
snapshot	A snapshot image is a logical copy of volume data, captured at a particular point-in-time. Like a restore point, snapshot images allow you to roll back to a known good data set.

Term	Description
SSD	Solid-state disks (SSDs) are data storage devices that use solid state memory (flash) to store data persistently. SSDs emulate conventional hard drives, and are available with the same interfaces that hard drives use.
storage array	A storage array includes shelves, controllers, drives, software, and firmware.
volume	A volume is a container in which applications, databases, and file systems store data. It is the logical component created for the host to access storage on the storage array.
workload	A workload is a storage object that supports an application. For some applications, System Manager configures the workload to contain volumes with similar underlying volume characteristics. These volume characteristics are optimized based on the type of application the workload supports.

E-Series hardware overview

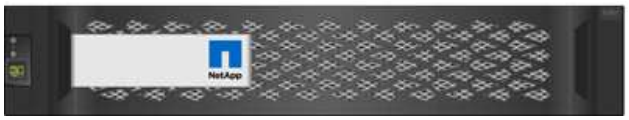
E-Series storage arrays are available in several configurations and models.

A storage array includes shelves, controllers, drives, software, and firmware. The array can be installed in a rack or cabinet, with customizable hardware for one or two controllers, in a 12-, 24-, or 60-drive shelf. You can connect the storage array to a SAN from multiple interface types and to a variety of host operating systems.

E-Series arrays are available in the following models:

- E2800 series — entry-level hybrid
- EF280 series — entry-level all flash
- EF300 series — entry-level all flash, all NVMe
- E5700 series — midrange hybrid
- EF570 series — midrange all flash
- EF600 series — midrange all flash, all NVMe

E2800 models

Component	Specification
Rack sizes:	• 2U12 (2 rack units; 12 drives) • 2U24 (2 rack units; 24 drives)  • 4U60 (4 rack units; 60 drives) 
Drives:	Supports the following drive types: • 3.5" NL-SAS (up to 180) • 2.5" SAS SSD (up to 120) • 2.5" SAS HDD (up to 180)
Interfaces:	Available with the following interfaces: • 12Gb SAS • 10Gb or 25Gb iSCSI • 16Gb or 32Gb Fibre Channel

EF280 models

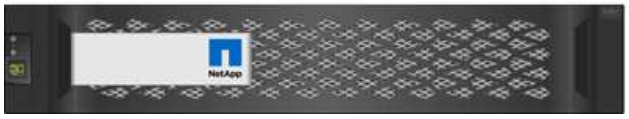
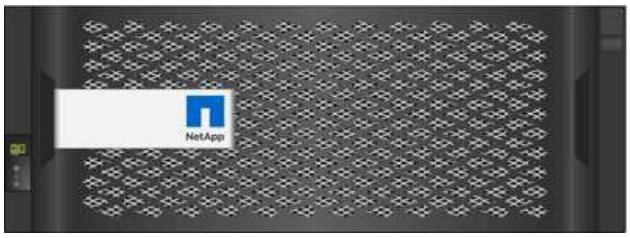
Component	Specification
Rack sizes:	2U24 (2 rack units; 24 drives) 
Drives:	Supports up to 96 SSD 2.5" drives

Component	Specification
Interfaces:	Available with the following interfaces: • 12Gb SAS • 10Gb or 25Gb iSCSI • 16Gb or 32Gb Fibre Channel

EF300 models

Component	Specification
Rack sizes:	2U24 (2 rack units; 24 drives) 
Drives and HICs:	Supports up to 24 NVMe SSDs, with a single host interface card (HIC) per controller.
Interfaces:	Available with the following interfaces: • 25Gb iSCSI • 32Gb NVMe / Fibre Channel • 32Gb SCSI / Fibre Channel • 100Gb iSER / IB • 100Gb SRP / IB • 100Gb NVMe / IB • 100Gb NVMe / RoCE

E5700 models

Component	Specification
Rack sizes:	• 2U24 (2 rack units; 24 drives)  • 4U60 (4 rack units; 60 drives) 
Drives:	Supports up to 480 of the following drive types: • 3.5" NL-SAS drives • 2.5" SAS SSD drives • 2.5" SAS HDD drives
Interfaces:	Available with the following interfaces: • 12Gb SAS • 10Gb or 25Gb iSCSI • 16Gb or 32Gb Fibre Channel • 32Gb NVMe / Fibre Channel • 100Gb iSER / IB • 100Gb SRP / IB • 100Gb NVMe / IB • 100Gb NVMe / RoCE

EF570 models

Component	Specification
Rack sizes:	2U24 (2 rack units; 24 drives) 
Drives:	Supports up to 120 SSD 2.5" drives

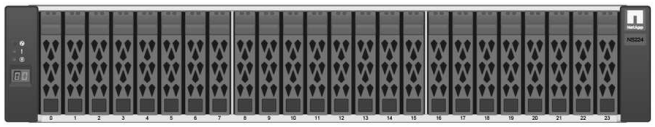
Component	Specification
Interfaces:	Available with the following interfaces: • 12Gb SAS • 10Gb or 25Gb iSCSI • 16Gb or 32Gb Fibre Channel • 32Gb NVMe / Fibre Channel • 100Gb iSER / IB • 100Gb SRP / IB • 100Gb NVMe / IB • 100Gb NVMe / RoCE

EF600 models

Component	Specification
Rack sizes:	2U24 (2 rack units; 24 drives) 
Drives and HICs:	Supports up to 24 NVMe SSDs, with two host interface cards (HICs) per controller.
Interfaces:	Available with the following interfaces: • 25Gb iSCSI • 32Gb NVMe / Fibre Channel • 32Gb SCSI / Fibre Channel • 100Gb iSER / IB • 100Gb SRP / IB • 100Gb NVMe / IB • 100Gb NVMe / RoCE • 200Gb iSER / IB • 200Gb NVMe / IB • 200Gb NVMe / RoCE

E-Series shelf types

E-Series systems are available in a variety of shelf sizes.

Shelf type	Illustration
DE212C: • 2u12 (2 rack units; 12 drives) • 3.5" HDDs and/or 2.5" SSDs (with adapter) • E2800 controllers only	
DE224C: • 2u24 (2 rack units; 24 drives) • 2.5" HDD and/or 2.5" SSD drives • E2800, EF280, E5700, and EF570 controllers	
DE460C: • 4u60 (4 rack units; 60 drives) • 3.5" and 2.5" drives (NL-SAS, SAS, and SSD) • E2800 and E5700 controllers	
NE224: • 2u24 (2 rack units; 24 drives) • 2.5" NVMe SSD drives • EF300 and EF600 controllers	

SANtricity software overview

E-Series systems include SANtricity software for storage provisioning and other tasks.

SANtricity software consists of these management interfaces:

- System Manager — a web-based interface used for managing one controller in a storage array.
- Unified Manager — a web-based interface used for viewing and managing all storage arrays in your network.
- Web Services Proxy — a REST API used for viewing and managing all storage arrays in your network.
- Command line interface (CLI) — a software application for configuring and monitoring storage arrays.

EF600 and EF300 storage arrays do not support mirroring, thin volumes, or SSD Cache features.

SANtricity System Manager

System Manager is web-based management software embedded on each controller. To access the user interface, point a browser to the controller's IP address. A setup wizard helps you get started with system

configuration.

System Manager offers a variety of management features, including:

 **Performance**	View up to 30 days of performance data, including I/O latency, IOPS, CPU utilization, and throughput.
 **Storage**	Provision storage using pools or volume groups, and create application workloads.
 **Data protection**	Perform backup and disaster recovery using snapshots, volume copy, and remote mirroring.
 **Hardware**	Check component status and perform some functions related to those components, such as assigning hot spare drives.
 **Alerts**	Notify administrators about important events occurring on the storage array. Alerts can be sent through email, SNMP traps, and syslog.
 **Access Management**	Configure user authentication that requires users to log in to the system with assigned credentials.
 **System Settings**	Configure other system performance features, such as SSD cache and autoload balancing.
 **Support**	View diagnostic data, manage upgrades, and configure AutoSupport, which monitors the health of a storage array and sends automatic dispatches to technical support.

SANtricity Unified Manager

Unified Manager is web-based software used for managing your entire domain. From a central view, you can

see status for all newer E-Series and EF-Series arrays, such as the E2800, EF280, EF300, E5700, EF570, and EF600. You can also perform batch operations on selected storage arrays.

Unified Manager is installed on a management server along with the Web Services Proxy. To access Unified Manager, you open a browser and enter the URL pointing to the server where the Web Services Proxy is installed.

Unified Manager offers a variety of management features, including:

 **Discover storage arrays**	Find and add the storage arrays you want to manage in your organization's network. You can then view the status of all storage arrays from a single page.
 **Launch**	Open an instance of System Manager to perform individual management operations on a particular storage array.
 **Import Settings**	Perform a batch import from one storage array to multiple arrays, including settings for alerts, AutoSupport, and directory services.
 **Mirroring**	Configure asynchronous or synchronous mirrored pairs between two storage arrays.
 **Manage Groups**	Organize storage arrays into groups for easier management.
 **Upgrade Center**	Upgrade the SANtricity OS software on multiple storage arrays.
 **Certificates**	Create certificate signing requests (CSRs), import certificates, and manage existing certificates for multiple storage arrays.

 **Access Management**	Configure user authentication that requires users to log in to Unified Manager with assigned credentials.

SANtricity Web Services Proxy

The Web Services Proxy is a RESTful API server that can manage hundreds of new and legacy E-Series arrays. The proxy is installed separately on a Windows or Linux server.

Web Services includes API documentation that allows you to directly interact with the REST API. To access the Web Services API documentation, you open a browser and enter the URL pointing to the server where the Web Services Proxy is installed.

Command line interface (CLI)

The command line interface (CLI) is a software application that provides a way to configure and monitor storage arrays. Using the CLI, you can run commands from an operating system prompt, such as the DOS C: prompt, a Linux operating system path, or a Solaris operating system path.

E-Series videos

Access video demos to learn more about E-Series systems.

E-Series: Fast, Simple, Reliable Storage

This video highlights the key benefits of using NetApp E-Series systems versus using commodity servers for storage.

NetApp video: Key benefits of using NetApp E-Series systems versus using commodity servers for storage

System Manager: Easy Setup and Configuration

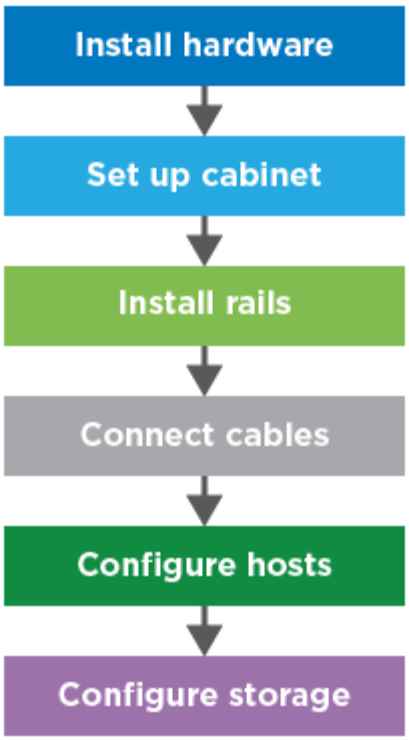
This Technical Demo shows how the web-based SANtricity System Manager interface enables easy set-up and configuration of the NetApp E2800.

NetApp video: SANtricity System Manager: Easy Setup and Configuration

Get up and running with E-Series

To get up and running with E-Series systems, you install hardware components, configure host systems, and configure storage.

Deploying the storage array involves the following workflow:



Step 1: Install hardware

To install the E-Series hardware, access the Installation and Setup instructions for your storage array and shelf type:

- EF600 or EF300 series with 24-drive shelf
- E2800/EF280 or E5700/EF570 series with 12- or 24-drive shelves
- E2800 or E5700 series with 60-drive shelf

Step 2: Set up cabinet

If you are setting up a new cabinet for the storage array, you need to move the cabinet to its permanent location, install the hardware, and connect it to a power source. To set up the cabinet, access the following instructions:

- Install 3040 40U cabinet

Step 3: Install rails

When shipped, each shelf includes rack-mounting hardware. For detailed instructions on installing the rails, select your rail types:

- Install adjustable support rails
- Install 2U enclosure into a four-post rack
- Install DE224C shelf into a two-post rack
- Install SuperRail into a four-post rack (DE224C/DE460C shelves)

Step 4: Connect cables

The Installation and Setup instructions (Step 1) include instructions for connecting cables. However, if you need lists of supported cables and transceivers, best practices for cabling, and detailed information about the host ports for your controller, access the following instructions:

- Cable E-Series hardware

Step 5: Configure hosts

To make storage available to a host, select a guide for the host's operating system type:

- Linux express configuration
- VMware express configuration
- Windows express configuration

Step 6: Configure storage

To configure storage, you can access the web-based interface, System Manager, by pointing a browser to the controller's IP address. A setup wizard helps you get started with system configuration. As an alternative, you can also use the command line interface (CLI).

Select the interface you want to use:

- SANtricity System Manager Online Help for 11.7x
- SANtricity System Manager Online Help for 11.6x