

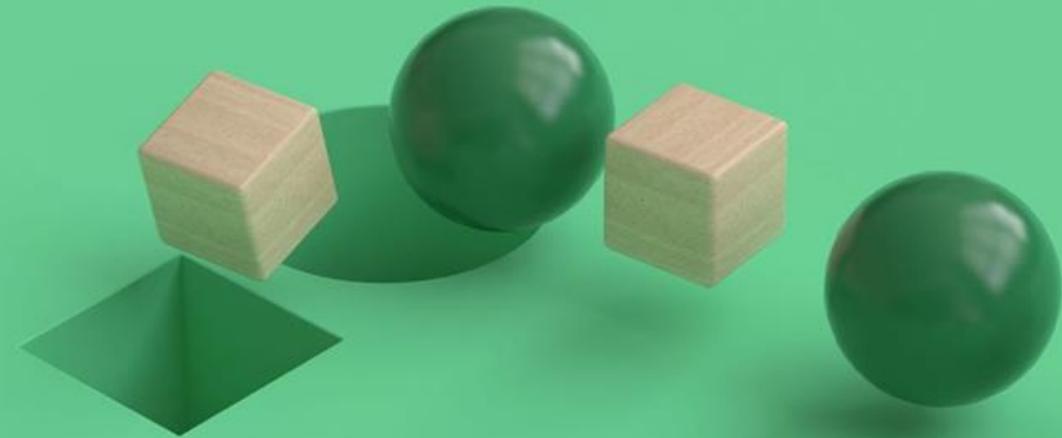
E-Series Hybrid Arrays



Agenda

- E-Series overview
- E-Series solutions
- SANtricity® software
- E-Series storage arrays
- E-Series video surveillance with COTA
- Summary

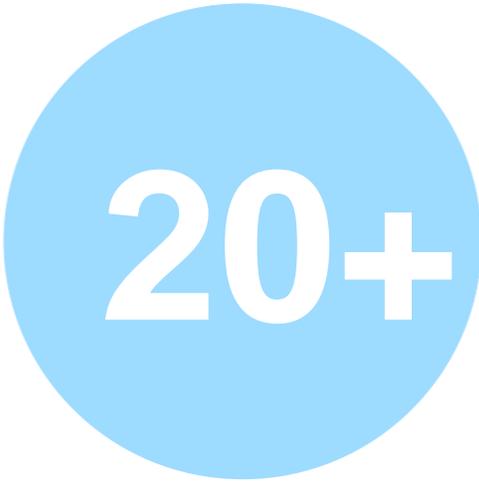
E-Series Overview



NetApp E/EF-Series Leadership



systems shipped



years of OS hardening



patents



items in current interoperability matrix



NetApp® SANtricity® is the #1* SAN OS

*Based on NetApp plus OEM sales

“Instead of having a bunch of little systems, we were able to centralize storage and management under one umbrella. Between Genetec and NetApp, we have a bulletproof solution that’s fully replicated and completely sustainable.”

Aaron Hibbard Senior Systems Engineer,
Central Ohio Transit Authority - COTA

NetApp E-Series Overview

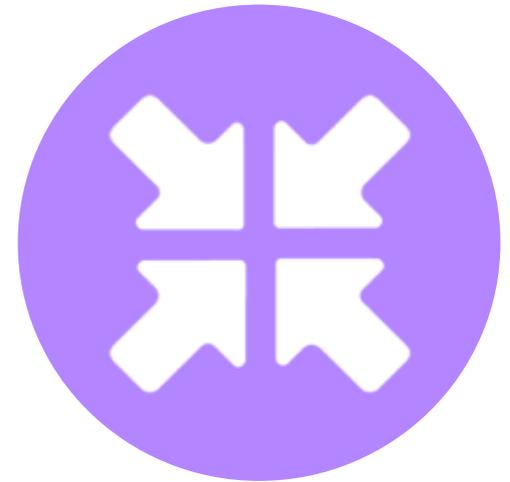
Derive faster, more actionable results from databases, high-performance computing, and analytics workloads



Powerful Performance



Smart Value



Trusted Simplicity

E/EF Solutions

Workloads that require **fast**, **simple**, **reliable** storage building blocks

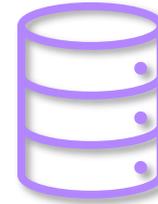


HPC/AI & Modern Analytics

- NVIDIA SuperPOD with EF-Series & BeeGFS is a proven solution that takes the risk out of deployment and configuration
- Easily scalable E-Series based building blocks for parallel filesystems such as BeeGFS and Spectrum Scale. Serving different workloads without sacrificing key business value (consistent speed of access and response time).
- Block storage for the performance you need for analytics solutions

E5700
EF300
EF600

Enterprise Databases and VMware



- High-performance and low latency to increase transactions per minute
- Simple block storage for ease of setup and configuration
- Value in an enterprise database
- Seamless integration with new or existing VMware environments

E2800
EF300
EF600

Backup & Recovery



- Cost-effective + high density
- High-performance array
- Multiple connectivity options

E2800
E5700
EF300

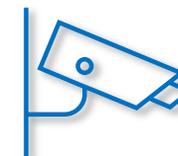
Media & Entertainment



- Error-free delivery of high-res video with a small footprint
- Consistent high-throughput and ultra-low response times with zero dropped frames & extreme uptime
- Proven install base with M&E-focused file systems

E5700
EF300
EF600

Video Analytics & Surveillance

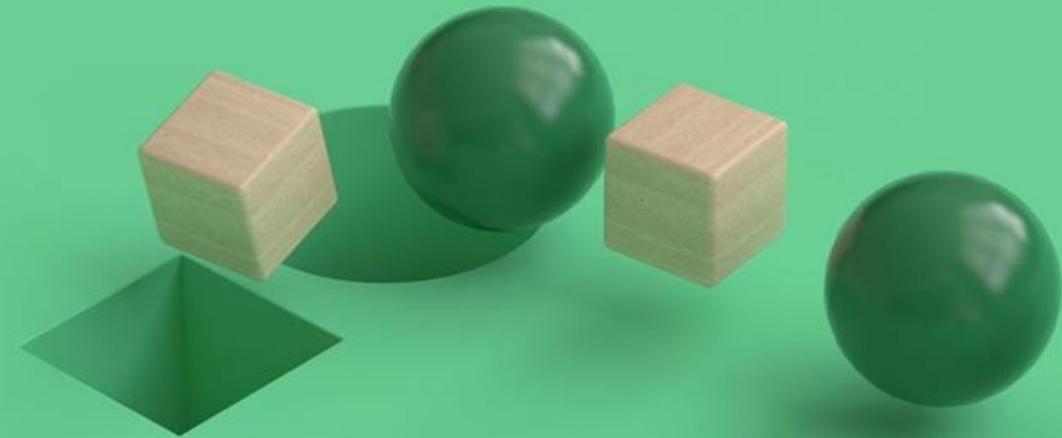


- No dropped frames
- No lost video segments
- No failed video recalls
- No emergency repairs

E2800
E5700
EF300
EF600

E-Series Solutions

Enterprise storage building block for best-in-class solutions for Video Surveillance



What's happening in video storage

Major trends are impacting data storage

Trend:



High resolution
cameras



Longer retention
times



Analytics

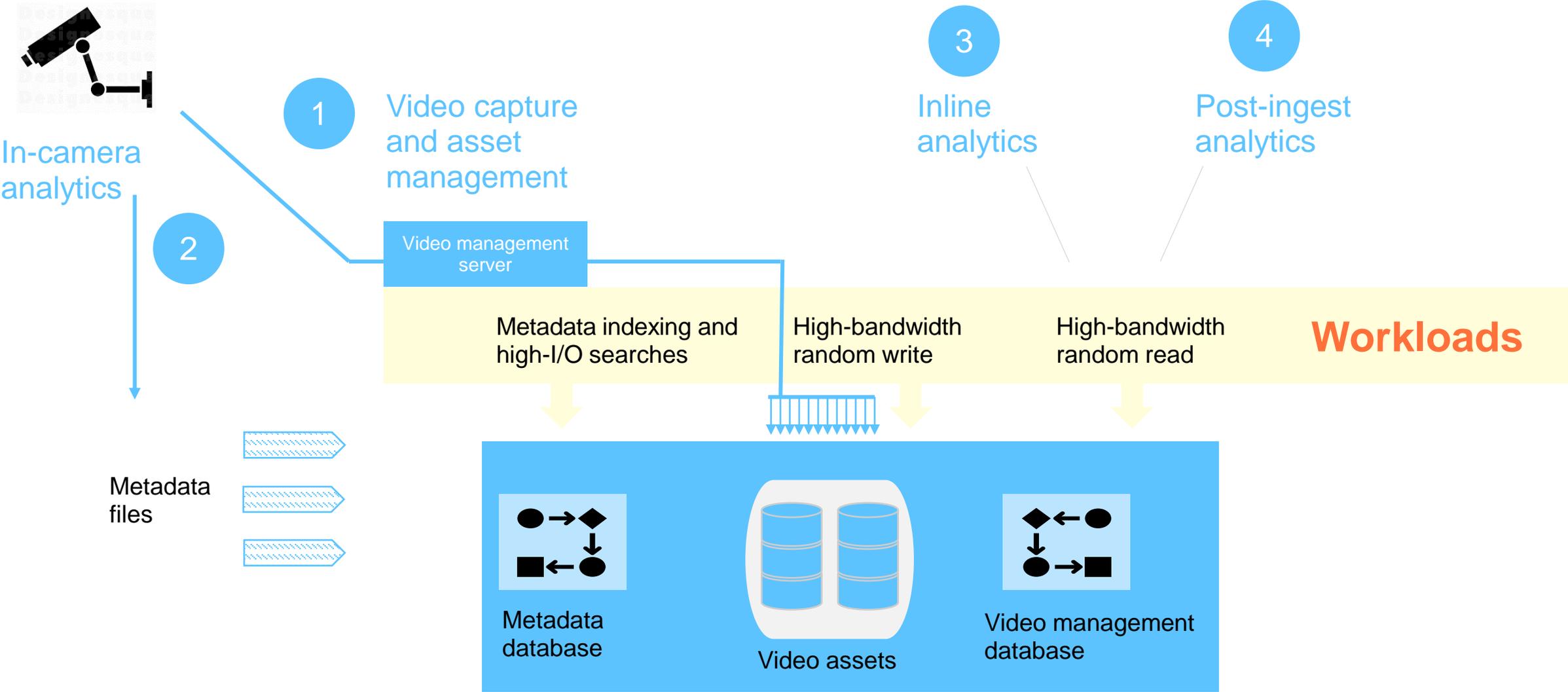
Impact on Storage Layer:

Higher bandwidth and capacity utilization

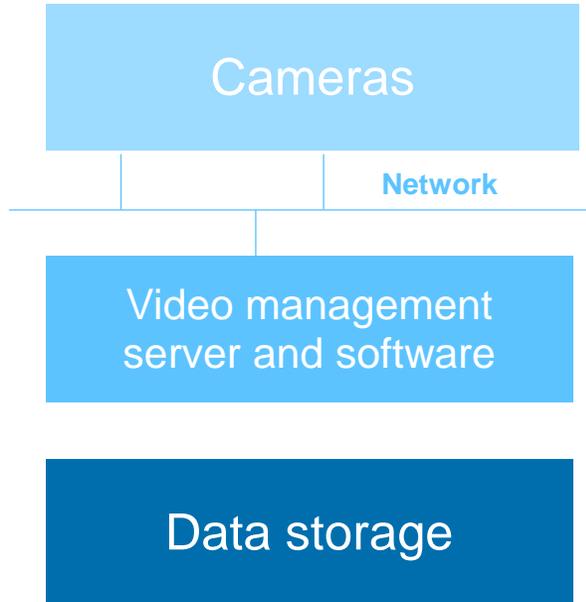
Increased Capacity Utilization

Different workloads (high-transaction or I/O)

Surveillance Storage Faces Multiple Types of Workloads



Modernizing the Video Surveillance Infrastructure



— Can scale in camera count or resolution

— Able to add faster processors, change software, add GPU analytics –integrate other applications

— Expand any dimension of the storage easily (add flash, grow capacity, add performance...)

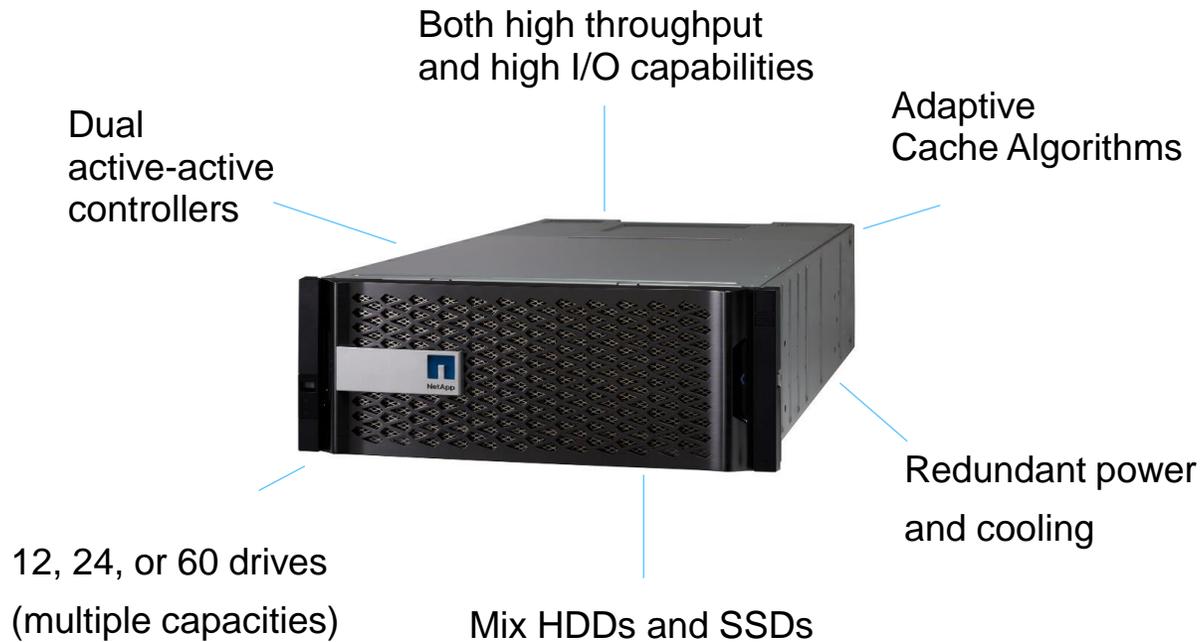
An Enterprise Application-Serving Architecture

Why E-Series for Video Surveillance Storage

- Versatility for the needs of today and tomorrow
 - Senses and adapts to multiple simultaneous workloads
 - Up to 72,000 Mb/s per array for video (E5700); 2 million IOPS for analytics (EF600)
 - Mix and match flash and spinning drives for VMs or analytics
- 6 9's availability for video assets:
 - **No 40% performance impact** from disk failure
 - Fast rebuild – less exposure
 - No downtime for upgrades, component or drive swaps, failovers...
- IT and data center optimization:
 - Evolved, simplified management
 - Space, power, and cooling efficiency
 - Scale up to dozens of petabytes, even in small increments

E-Series Solutions for Video Surveillance

SAN attached storage for Video Surveillance



Start small

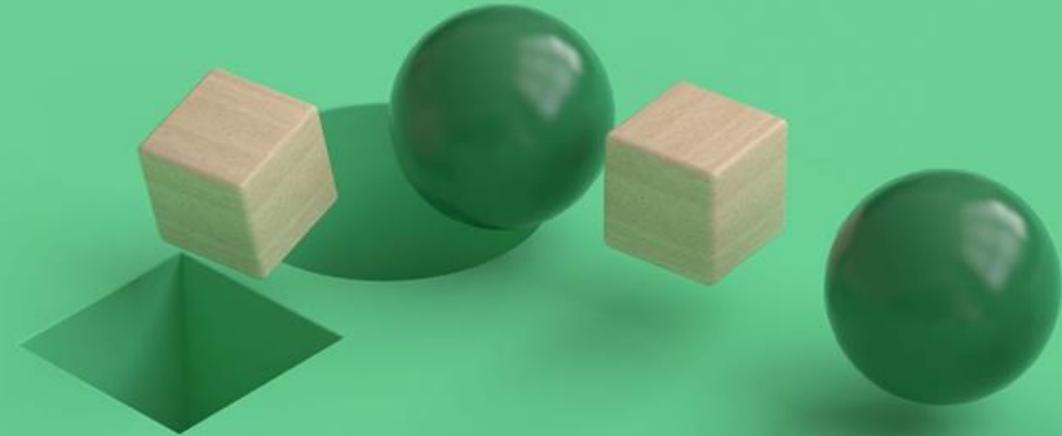
- 1 shelf = 558 cameras
- 3 shelves in a "pod"

Add pods as needed

- 3 pods in a rack
- 5,022 cameras per rack



SANtricity Software



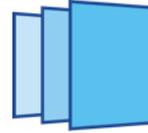
SANtricity OS Features

Performance-optimized OS, all features bundled with NetApp® SANtricity® software



Dynamic Disk Pools

8 times faster rebuild (minutes, not days) and continuous high performance during drive rebuild



Snapshot, Volume Copy & Remote Mirroring*

Protect, clone and replicate your data for cost-effective disaster recovery and business continuance

* Remote Mirroring not available on EF300/EF600



NetApp ActiveIQ

Predictive analytics and proactive support to optimize operations across your hybrid cloud.



Data Assurance

Verifies data using T10PI Data Integrity Field standard to protect against silent data corruption. Fast offline Volume Group initialization.



Enterprise Security & Administration

Includes role-based access control, multi-factor authentication support, secure CLI and support for Active Directory



Encrypted Drives*

FIPS and FDE encrypted media for data-at-rest security. Includes local or external key management options. Sanitization options for drives. Support for TLS 1.3

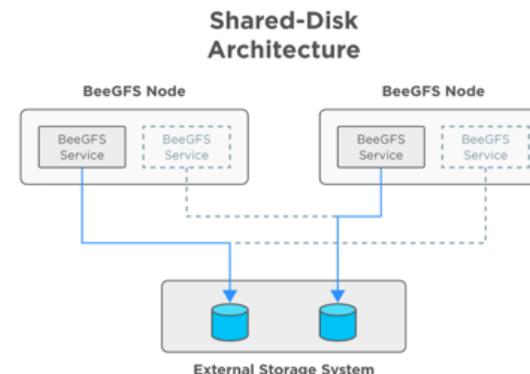
* Limited to non-restricted countries

NetApp's BeeGFS solutions development



NetApp enables BeeGFS for next generation workloads at any scale

- Management: Automate [deploying and managing BeeGFS using Ansible](#)
 - Enables massive, repeatable, and consistent deployments at scale with Infrastructure as Code
- Simplicity with cloud-native integrations: [BeeGFS CSI driver](#).
 - Use directories in BeeGFS as Persistent Volumes in cloud orchestrators like Kubernetes
- Performance: NVIDIA MagnumIO GPUDirect Storage (GDS) support for BeeGFS
 - For maximum sustained I/O performance and minimum latency
- Monitoring: [BeeGFS plugin](#) for performance analyzer with Grafana
- Reliability: HA services with shared disk architecture
 - Reduce cost over solutions that require mirroring data



SANtricity Unified Manager

Enterprise management

- Browser-based enterprise view
 - Manage up to 500 arrays
 - Organize by folder/group
 - View status, launch System Manager
 - Mass setup for event notification, ASUP, security
 - Simple configuration replication
 - Manage upgrades easily
- Framework for investment
 - Incremental updates in twice-yearly cadence
 - Manages EF600, EF300, E5700, E2800
 - Installs on a Windows or Linux management server

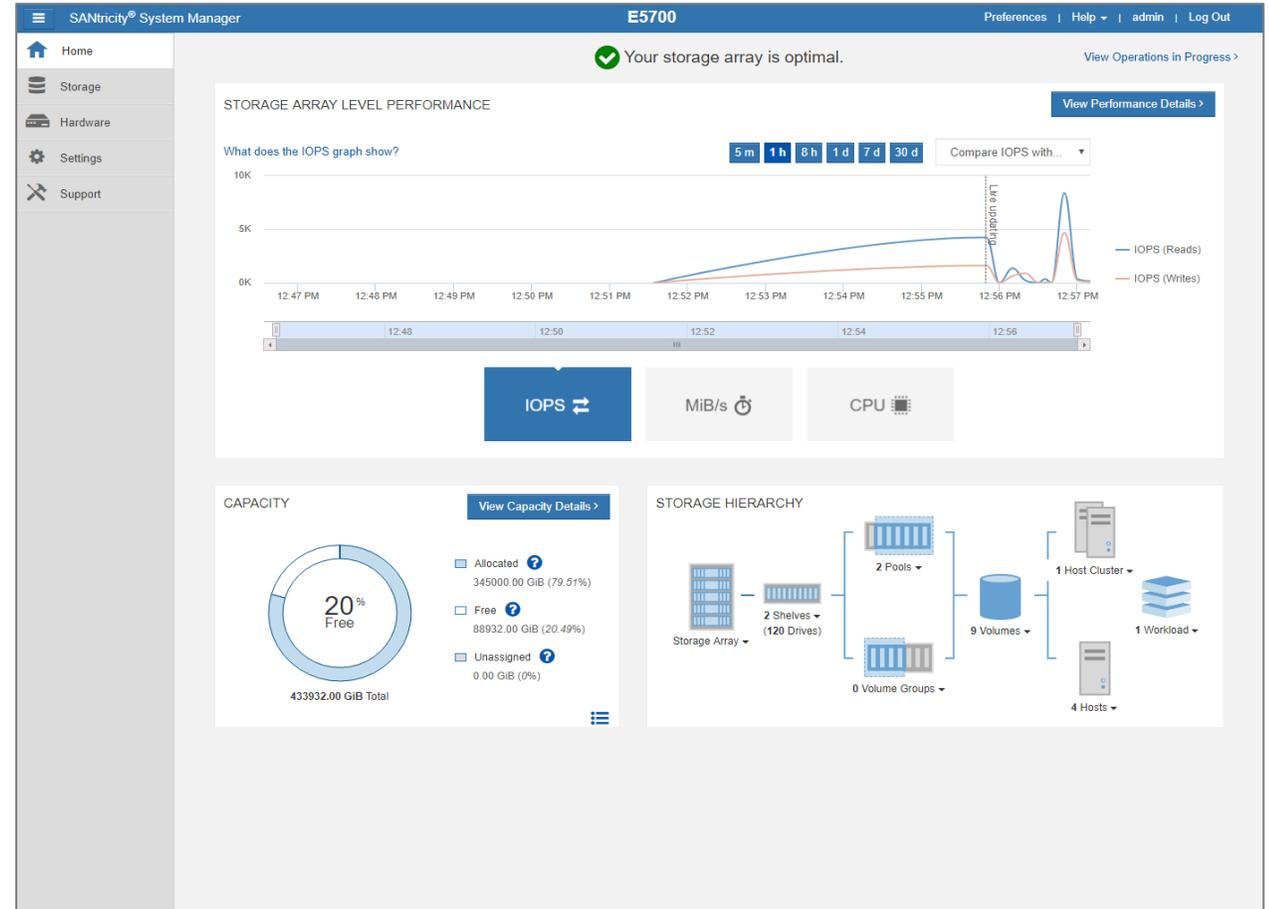
The screenshot displays the SANtricity Unified Manager interface. On the left is a navigation sidebar with categories like 'Manage', 'Certificate Management', 'Access Management', 'Operations', and 'Support'. The main area is titled 'MANAGE - All' and contains a table of storage arrays. A dropdown menu is open over the 'Upgrade Center' button, listing actions such as 'Pre-Upgrade Health Check' and 'Upgrade SANtricity OS Software'. The table shows columns for checkboxes, names, status, and version numbers.

<input type="checkbox"/>	Storage Array	Status		
<input type="checkbox"/>	DataProt_Production	Needs Attention		
<input type="checkbox"/>	DataProt_Backup	Optimal		
<input type="checkbox"/>	EF280-1	Optimal	2806	11.70.2
<input type="checkbox"/>	EF280-2	Optimal	2804	11.70.2
<input type="checkbox"/>	EF600_240x16TB_drives	Optimal	6000	11.70.3

SANtricity System Manager

Simple on-box management

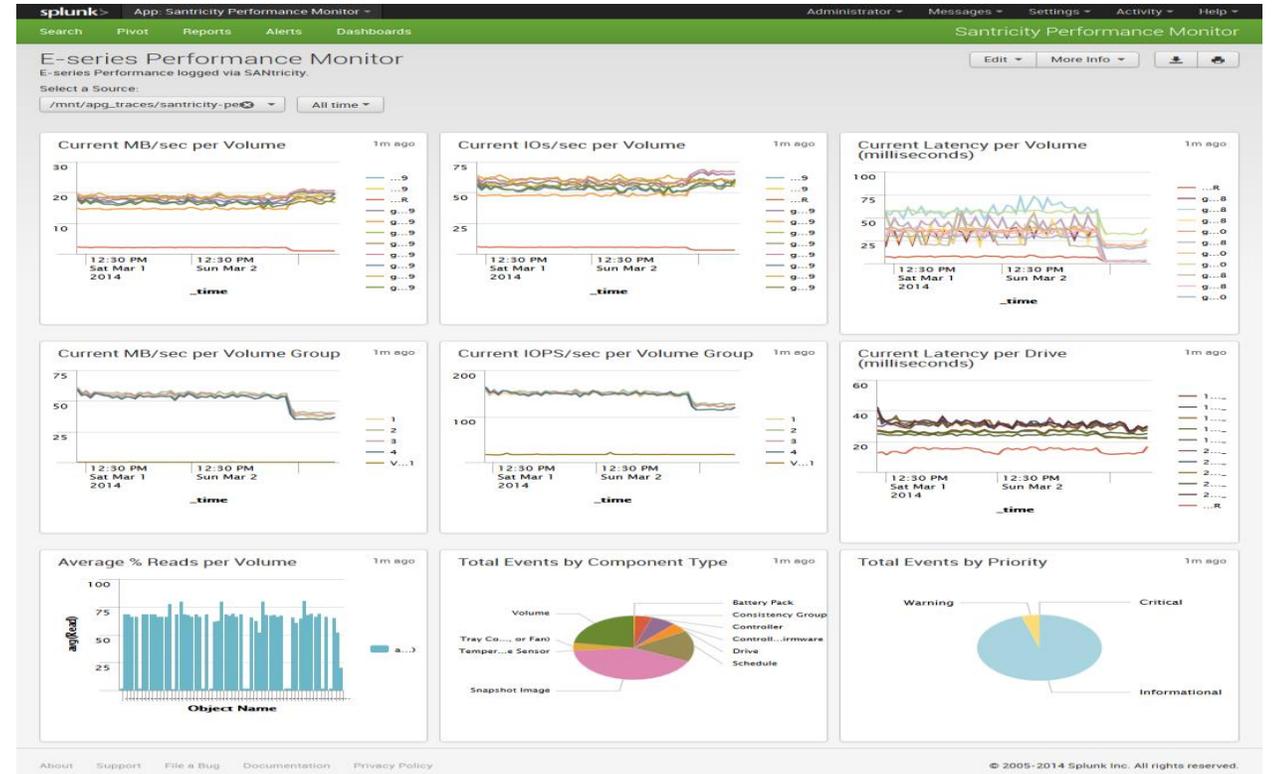
- Manage your NetApp E/EF systems anytime, anywhere
 - Easy-to-use, on-box, web-based interface
 - Enhanced performance monitoring and tuning
 - Automated workflows
- Designed for secure access
 - Role-based access control and audit log
 - External Key Management
 - Multifactor authentication enabled via SAML
- Management APIs and orchestration tools
 - Web Services REST API
 - Secure SANtricity CLI
 - Splunk, Ansible, vCenter



SANtricity plug-in for Splunk Enterprise

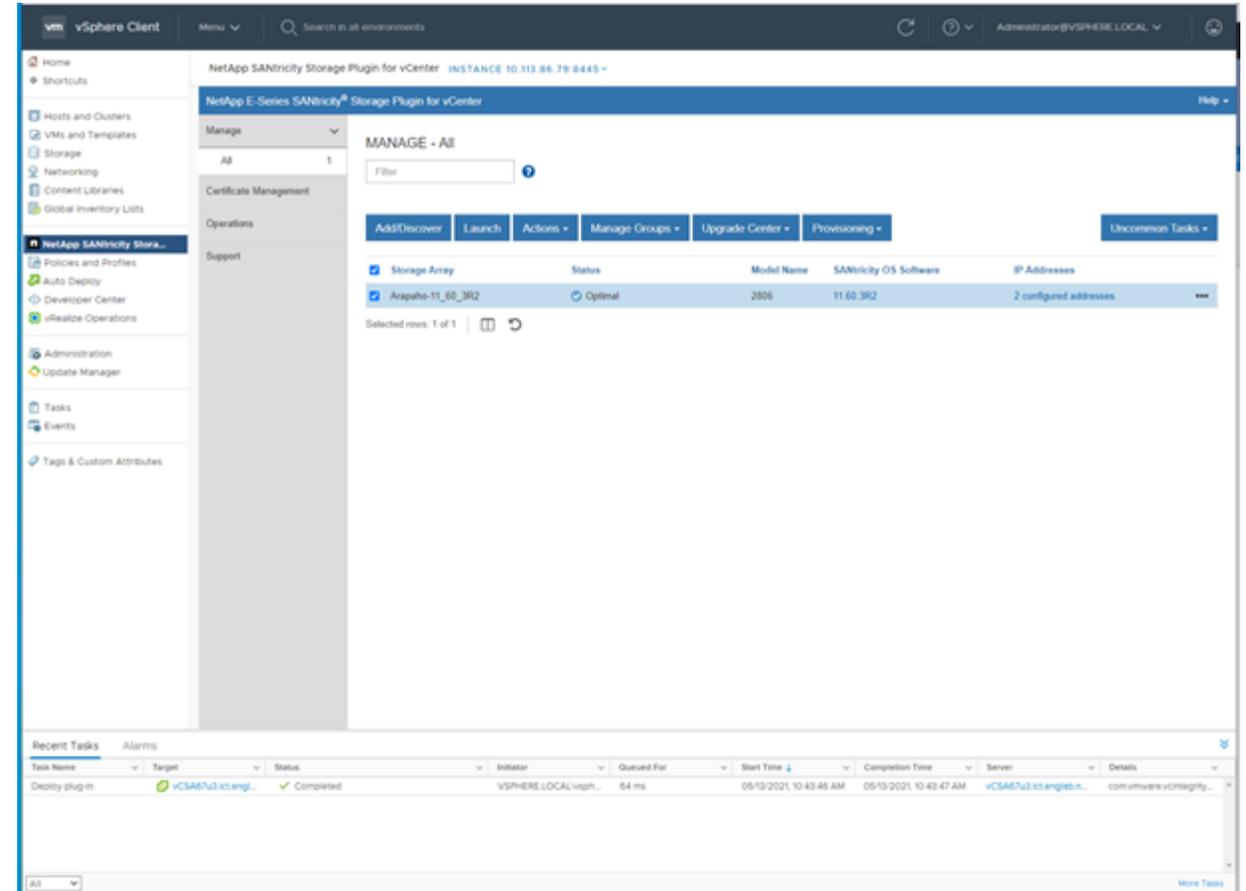
Visual performance information with drill-down capability

- Displays configuration information
 - Dashboard view for multiple storage systems
 - Drill-down to specific configuration information for each array
- Monitors performance
 - Per-array basis
 - IOPS, MBps, latency
 - Drill-down capability
 - Controller, disk pools, volume groups, volumes, drives
 - Retains up to one year of information
- Displays event log information
 - Sortable log views, top-10 frequency
- [NetApp Community: Monitoring your NetApp array with Splunk](#)



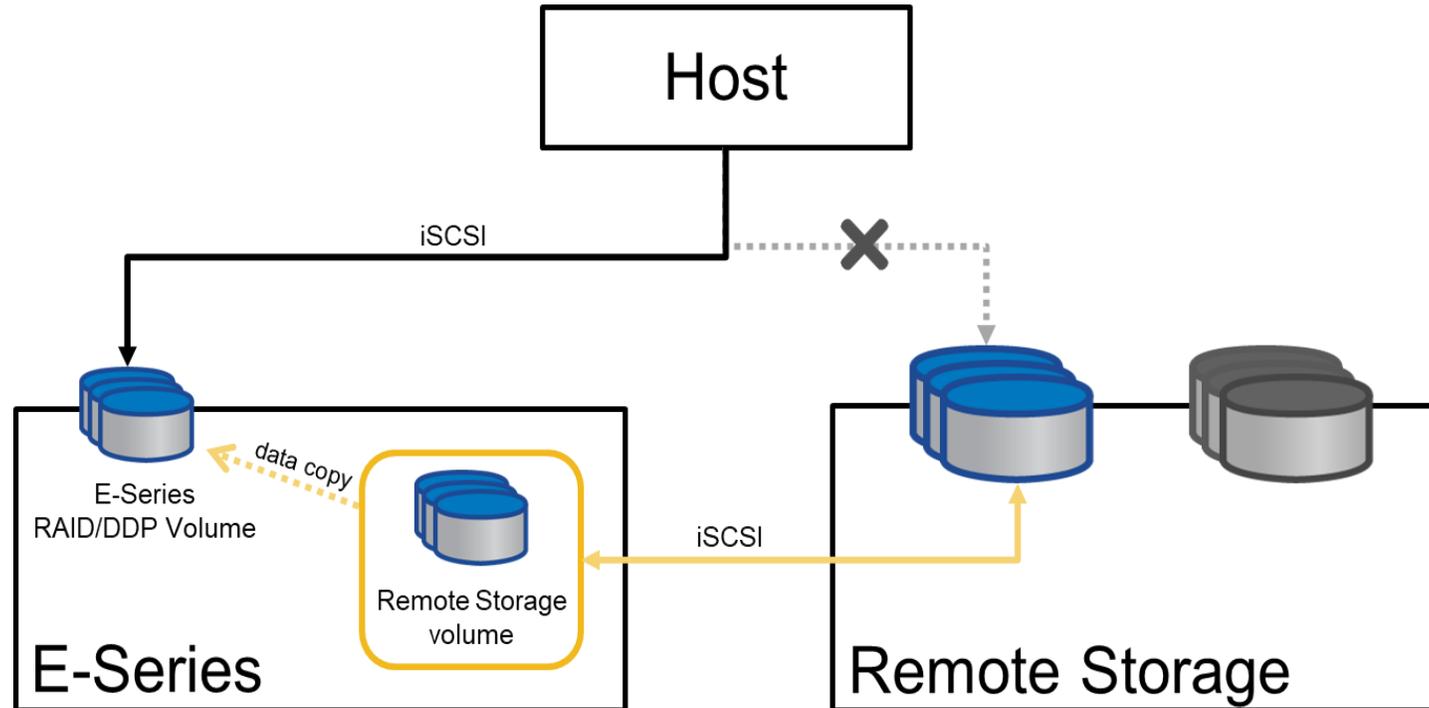
SANtricity Storage Plugin for vCenter

- Plugin's interface leverage UI elements from SANtricity OS
 - Enterprise View : Unified Manager
 - Storage Provisioning : System Manager
- Features Supported
 - View and manage discovered storage arrays
 - Perform batch operations on groups of storage arrays
 - Perform SANtricity OS upgrades
 - Create and manage Dynamic Disk Pools, Volume Groups, and Volumes
 - Certificate and Access management
 - Localization-ready
- Arrays Supported
 - E2800, E5700, EF300, EF600
 - Host Protocols : iSCSI, FC, NVMe/FC
 - SANtricity OS versions : 11.60.2 and higher
- VMWare ESXi Versions Supported: 6.7, 7.0

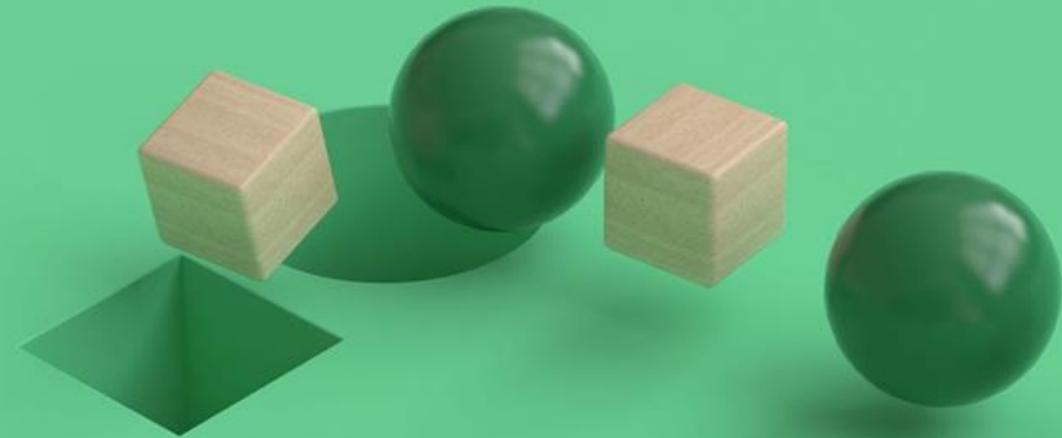


SANtricity Remote Storage Import

- Used to import data from remote storage devices to E-Series volumes with minimal downtime



E-Series Hardware



NetApp E-Series Storage Systems

Fast, simple, reliable block storage

Midrange Hybrid (E5700)



With NVMe host protocols!

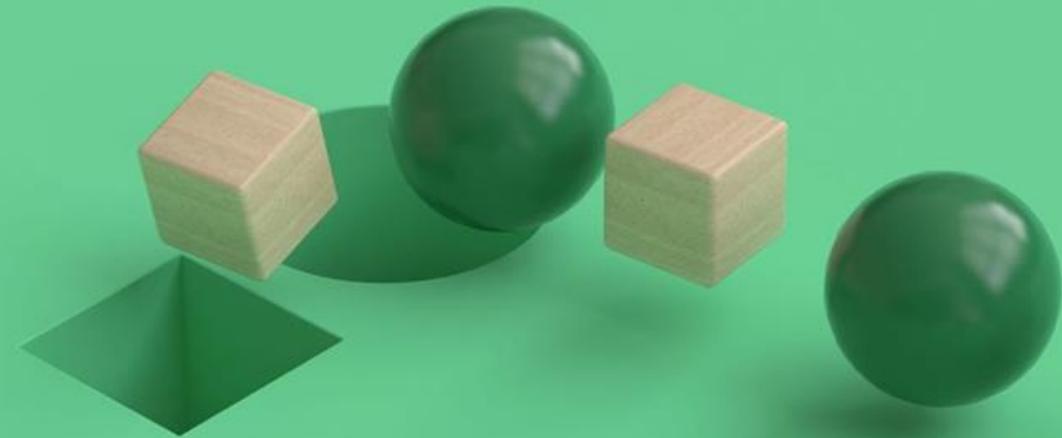
- **Price/performance focused**
- An ideal solution for Splunk and Hadoop (dedicated HDFS), as well as Oracle, BeeGFS, and AI workloads that require InfiniBand
- 480 drives (120 SSD drives)
- 8.64PB
- NVMe/IB, NVMe/FC, NVMe/RoCE
- SRP/IB, iSER/IB, FC, iSCSI, SAS
- 1 Million IOPs (Random Reads)
- 21GB/sec (Reads)
- 2U24, 4U60

Entry Hybrid (E2800)



- **Offers affordable performance at the lowest cost**
- Ideal for midsize businesses and remote offices that stream media and run-data analytics
- 180 drives (120 SSD drives)
- 3.24PB
- FC, SAS, iSCSI
- 300K IOPs (Random Reads)
- 10GB/sec (Reads)
- 2U12, 2U24, 4U60

E-Series Success



Central Ohio Transit Authority - COTA

Building Smarter Transportation Solutions with Enhanced Video Security

Business Challenge

- With hundreds of cameras recording high-definition video around the clock, COTA's IT department grappled with capacity limitations. Across the system, white-box digital video recorders (DVRs) were being pushed to their limits, with as many as 40 cameras recording to a single DVR. With DVRs running out of storage space, COTA could not meet its goals for data retention. Downtime due to failed DVR drives became more frequent, and costs began to rise.

Solution

- E-Series as part of FlexPod® Select, a converged infrastructure solution with Cisco servers and switches and NetApp E-Series storage.

Benefits

- NetApp's integration with Genetec further simplified deployment and management of the solution.
- Around the clock availability.
- Improved safety and security for millions of riders.



“Instead of having a bunch of little systems, we were able to centralize storage and management under one umbrella. Between Genetec and NetApp, we have a bulletproof solution that's fully replicated and completely sustainable.”

Aaron Hibbard Senior Systems Engineer, COTA

Summary

- The value and performance of E-Series
- E-Series solutions
- SANtricity supporting your success
- E-Series storage systems
- Success stories deploying E-Series

Additional content

- E-Series platforms
 - [Introduction to NetApp E2800 Array | NetApp](#)
 - [Introduction to NetApp E5700 Array | NetApp](#)
- VSS
 - [VSS user story: Central Ohio Transit Authority – COTA](#)
 - [NetApp E-Series for Video Surveillance Best Practices Guide Deploy and Configure E-Series for Video Surveillance](#)
 - [Virtualizing video management systems with NetApp E-Series storage - Design and deployment guide](#)
- Everything E-Series
 - [E-Series documentation \(netapp.com\)](#)

Thank you

