

Advanced Storage for Media Workflows

FLEXIBLE, MODULAR APPROACHES TO TODAY'S MEDIA STORAGE CHALLENGES

THE POST STUDIO SHARED-STORAGE CHALLENGE: MIXED WORKFLOWS

Modern media workflows present significant challenges for shared-storage infrastructures. The proliferation of file types, codecs, resolutions, bit rates, compressed and uncompressed media formats, together with artists' expectations of instant access and minimal latency, has made it increasingly difficult for traditional monolithic storage systems to keep up.

The rapid adoption of 4K, 8K, and HDR (high dynamic range) content production continues to grow single-stream bandwidths, increasing overall storage performance requirements. At the same time, post workflows are becoming increasingly heterogenous as artists employ a broader range of hardware and software platforms to perform editorial, graphics, VFX, color, and finishing tasks. The resultant workload, a mixture of small-

block and large-stream, random access and sequential files, can bring an untuned, off-the-shelf storage solution to its knees.

In these environments, the need for a highly configurable, modular storage solution becomes clear, one that employs a custom mixture of storage technologies optimized to deliver performance and reliability across the entire post process.

THE SOLUTION: MODULAR STORAGE "BUILDING BLOCKS"

Nytro® X 2U24



Ideal for demanding 4K and 8K workflows, color grading and finishing, image sequence processing, and other high-bandwidth / low-latency tasks. Can be deployed in hybrid tiered systems to accelerate hard drive-based volumes.

- High-Performance All-Flash Array (AFA)
- Familiar 2u form factor with 24 - 2.5-inch Seagate SSDs
- Up to 7GB/s reads, 5.5GB/s writes (total system bandwidth)
- Ultra-low ~250 µs latency
- 16Gb/s Fibre Channel, 10Gb/s iSCSI, or 12Gb/s SAS
- Expandable up to 8 total chassis
- Combine with a hard drive chassis (i.e. Exos E 2U12) for tiered performance and capacity
- Supports RAID or Seagate ADAPT data protection
- Fully redundant, hot-swappable components

FAMILIAR FORM FACTORS FOR SMALL AND MID-SIZED STUDIOS

Many small and medium-sized production and post organizations have existing machine rooms with established rack layouts. For these cases, where rack reconfiguration could lead to significant operation interruption and downtime, Seagate offers solutions in familiar 2u chassis for simple drop-in replacement. Available in both Exos (hard drive based) and Nytro (SSD based) configurations, these models offer incredible value, performance and flexibility in a familiar form factor.

Exos® X 2U12



Ideal primary storage for small and mid-size studios. Excellent balance of price, performance, and capacity. Capable of up to 7GB/s aggregate reads when combined with additional 2u12 expansion chassis.

- High-Capacity Hard Drive Array
- Familiar 2u form factor with 12 - 3.5-inch Seagate hard drives
- Up to 192TB per chassis (16TB drives)
- Up to 7GB/s reads, 5.5GB/s writes (total system bandwidth)
- 16Gb/s Fibre Channel, 10Gb/s iSCSI, or 12Gb/s SAS
- Expandable up to 8 total chassis
- Supports RAID or Seagate ADAPT data protection
- Fully redundant, hot-swappable components
- Entry-level cost

FLASH + DISK = BEST OF BOTH WORLDS

Seagate's storage systems offer "auto-tiering" features that enable the combination of multiple types of storage into a single volume. Using this method, a small group of flash drives can transparently accelerate the performance of a large group of hard drives, combining flash's performance-enhancing speed with hard drives' outstanding capacity and affordability.

For small flash tiers, SSDs and hard drives can be mixed and matched in any chassis. For larger flash tiers, a dedicated all-flash array like the Nytro X 2U24 can be employed.

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HIGH-DENSITY SOLUTIONS

For larger organizations, such as those focused on VFX, 3D animation, broadcast, or streaming, minimizing the total storage “footprint” in their data center is increasingly paramount. In these situations, Seagate’s high-density storage arrays enable more PBs per rack through innovative solutions to

common high-density hurdles, such as thermal management, vibration coupling, and excess cabling.

Designed for standard-depth racks, the Exos AP 5U84 packs up to 1.3PB of storage in only 5u. For 1.2m racks, the Exos AP 4U100 features even higher density, with up to 1.6PB in 4u. Both

feature Seagate’s innovative Application Platform design, replacing traditional RAID controllers with x86 blade servers. This eliminates the need for external storage servers, reducing cable volume and complexity in the rack while enabling single-point management of the entire storage system.

Exos AP 5U84



High density integrated storage server ideal for private media clouds, custom file systems, asset management, streaming playout and other high-bandwidth / high-capacity applications.

- 5u form factor for 1m racks
- Up to 1.3PB of storage per chassis
- x86 Application Platform blade server controllers
- Customizable software stack enables unique workflow solutions
- Mix and match hard drives and SSDs in the same chassis for tiered solutions
- Linkable for multi-node operation
- Fully redundant, hot-swappable components

HIGH-CAPACITY HARD DRIVES – THE AFFORDABLE ANSWER

For many applications, such as large-scale streaming services, nearline archive and media asset management, the cost/capacity equation of disk still makes more sense than flash. In these situations, a large group of high-capacity hard drives can meet performance requirements while offering much greater capacity at lower costs. With individual 100TB disks expected to arrive by 2025, Seagate sees hard drives as a preferred long-term option for large-scale data.

See our products and solutions at seagate.com/enterprise-storage/systems

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Exos AP 4U100



Ultra-high density integrated storage server ideal for private media clouds, custom file systems, asset management, streaming playout and other high-bandwidth / high-capacity applications

- 4u form factor for 1.2m racks
- Up to 1.6PB of storage per chassis
- x86 Application Platform blade server controllers
- Customizable software stack enables unique workflow solutions
- Mix and match hard drives and SSDs in the same chassis for tiered solutions
- Linkable for multi-node operation
- Fully redundant, hot-swappable components

BEYOND RAID

RAID technology has formed the basis of multi-drive storage systems for over 40 years. With rapid advances in drive capacity, however, RAID is beginning to show its age. Under traditional RAID6, full rebuild times have climbed to over 55 hours for a 16TB hard drive, leaving volumes with degraded performance and vulnerable to critical data loss for long periods.

In answer to this situation, Seagate created ADAPT (Autonomic Distributed Allocation Protection Technology) our next-generation erasure encoding solution. It replaces traditional RAID types with a protection scheme that distributes the parity across a larger set of hard drives or SSDs. Built for large sets of drives, ADAPT is able to reduce rebuild times to as low as 5.3 hours while maintaining overall system performance.

