

MODERN FILE SYSTEM FUNCTIONALITY THAT CAN

SUPERCHARGE YOUR MEDIA WORKFLOWS



Quantum[®]



IDENTIFYING NEW REQUIREMENTS FOR STORING MEDIA CONTENT

Handle changing workflows with greater performance, flexibility, balance, and streamlined management.

In the media and entertainment industry, the basic requirements for data storage remain unchanged. Broadcast organizations, post-production houses, and animation and visual effects (VFX) studios need to ingest media quickly, then provide fast, consistent access to that content. Team members must be able to easily work with content and collaborate with colleagues on editing, color correction, FX, and a variety of other tasks. At the same time, organizations must cost-effectively preserve content for future use and protect it from damage and loss.

Not only are those primary requirements inherently difficult to achieve, but in the context of changing workflows they are even more so. So, what do today's storage platforms need to deliver?

PERFORMANCE

Organizations today must ingest media from more devices, work with higher-resolution content, and deliver finished products in a wider array of formats than ever before. These changes require not only greater storage capacity but also higher performance. Storage systems must rapidly ingest a large volume of

content and deliver a responsive experience for team members as they work with large, high-resolution files.

FLEXIBILITY

Storage must also provide the flexibility for change and growth. Rising demand for compelling content means that media organizations are under constant pressure to ramp up productivity and output. They need a storage platform that can support a growing number of team members, who might be located around the world and use a variety of operating systems and applications. The storage platform must easily accommodate new, complex workflows and integrate with a variety of storage and networking technologies.

BALANCE

Boosting performance and expanding capacity will be critical for accommodating high-resolution workflows and supporting a growing business. But organizations must balance performance and capacity with cost. They need a workflow-optimized solution that will let them make the best use of different types of storage across a multi-tier environment—which might include high-

performance flash drives, more economical hard disk drives (HDDs), object storage, data tape libraries, and even cloud archives.

STREAMLINED MANAGEMENT

As organizations consider new storage platforms, they must find one that helps streamline management of an increasingly complicated environment. They need a platform that can be fully integrated into their existing technology ecosystem, including the applications, operating systems, and media asset management (MAM) systems they already use. The platform should have a modern file system that binds together the collection of technologies and offers tools that help simplify monitoring and administration.

Quantum storage solutions, powered by the StorNext® file system and data management platform, can help your organization address new challenges of content storage for media and entertainment. You gain the performance and flexibility required for changing workflows. You can optimize the balance of performance, capacity, and cost. And you can streamline ongoing administration.



PERFORMANCE:
FOR TODAY'S ORGANIZATIONS,
"JUST GOOD ENOUGH" IS NO
LONGER GOOD ENOUGH

Maximize performance for high-resolution workflows with the StorNext file system.

In the past, post-production houses and other media organizations rarely needed screaming-fast storage performance. When working with low-resolution content, teams could conduct nonlinear editing, color grading, transcoding, and other tasks with storage performance that was “just good enough.” But today, broadcasters, movie studios, and other video production teams are increasingly moving to 4K and higher-resolution content. Post-production studios need to work in these higher-resolution formats to deliver the highest-quality results.

Adopting solid-state drives (SSDs) can be an important step toward delivering the storage performance that team members need when working with high-resolution files. But there is often a big difference between the theoretical performance of storage media and the actual performance that users experience.

How can you maximize the actual performance of your flash-based drives?

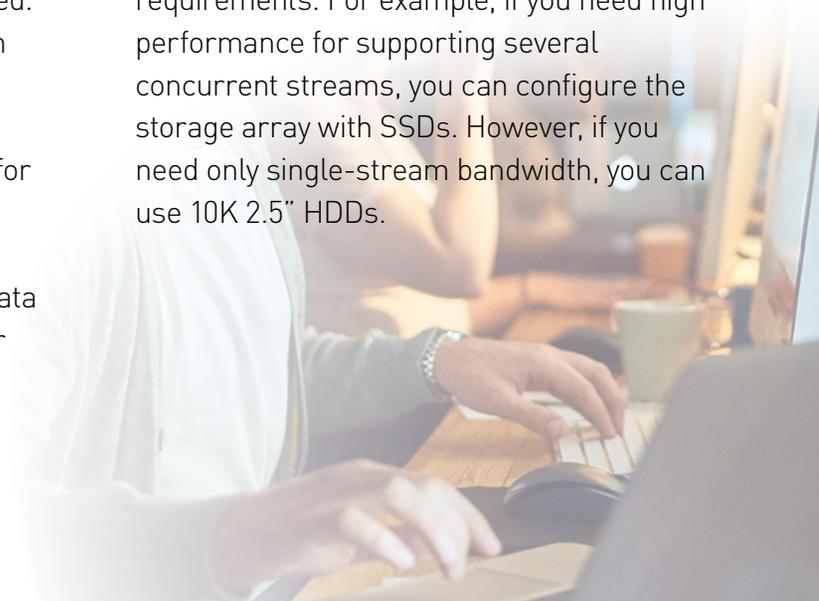
The file system plays a key role in delivering the robust performance that today’s high-resolution workflows demand. The speed at

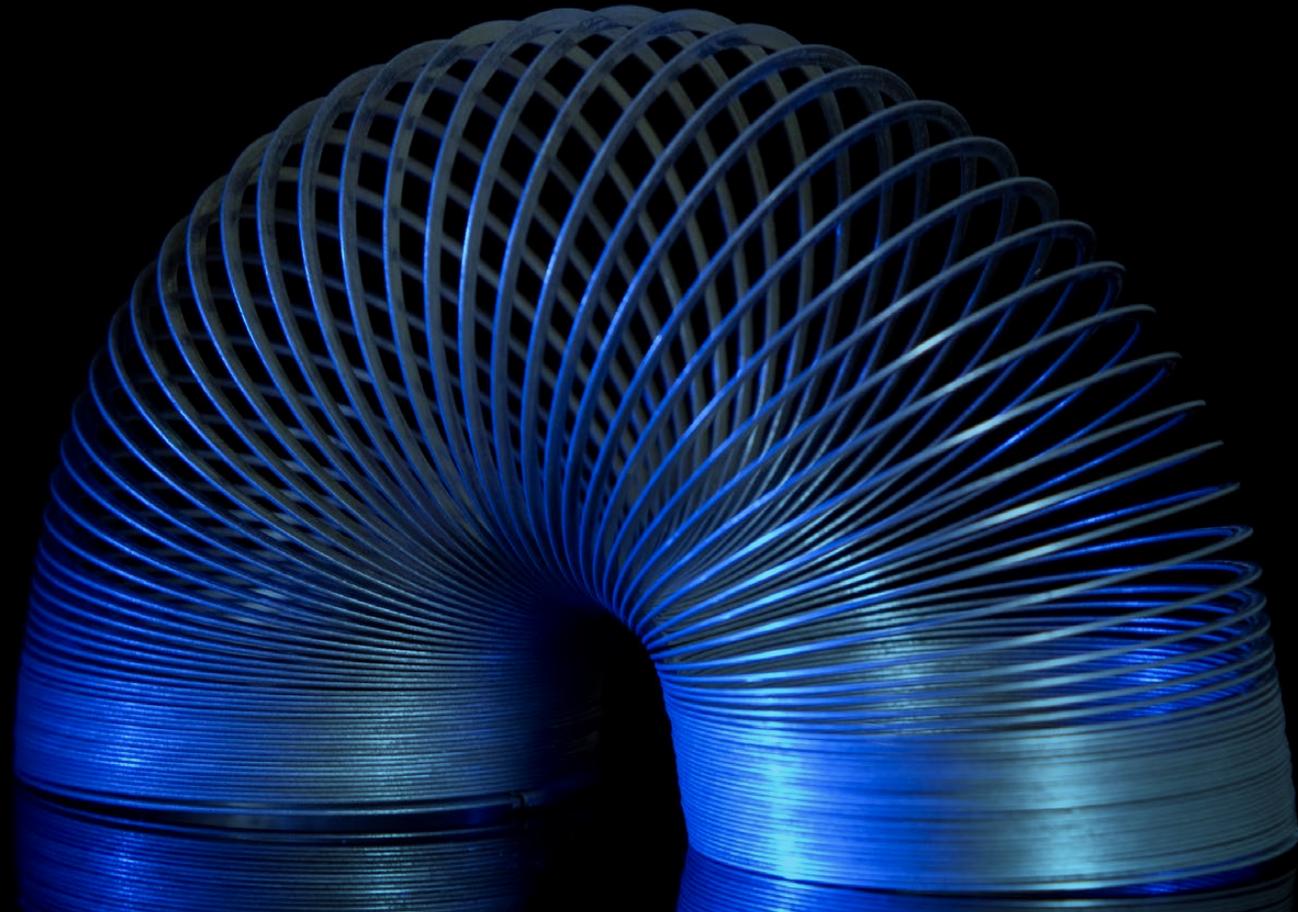
which files can be stored and retrieved partly depends on how efficiently the files’ structural metadata is stored. Structural metadata is information about the data, such as the creation date, location within a directory, and access permissions. This metadata is used for all content indexing and searching. The file system is responsible for updating that metadata whenever a file is created, accessed, modified, or deleted.

The StorNext file system separates user data and metadata operations to help enhance overall storage performance. Running those operations in parallel—but separately—enables both tasks to complete faster while helping ensure data transfer is unimpeded. With StorNext, most customers can even store all their file system metadata in L2 cache, which ultimately facilitates much better random I/O performance needed for small-data operations. StorNext then simultaneously writes large user data files—such as video files or application data sets—at block-level speeds across either SSDs or HDDs depending on the performance requirement.

StorNext further helps enhance storage performance by allowing you to slice the logical unit numbers (LUNs) that are assigned to individual storage devices. By slicing LUNs, you can create stripe groups that have similar speed characteristics within the device. Those stripe groups can then be matched to the performance characteristics of data. As a result, workloads that require high performance can be better aligned to the storage that supports those requirements.

With StorNext, you can also fine-tune the configuration of your high-performance arrays for your unique workflow requirements. For example, if you need high performance for supporting several concurrent streams, you can configure the storage array with SSDs. However, if you need only single-stream bandwidth, you can use 10K 2.5” HDDs.





FLEXIBILITY:
SUPPORT A GROWING
BUSINESS AND INCREASINGLY
REMOTE USERS

Facilitate collaboration among expanding teams and accommodate a variety of technologies with StorNext.

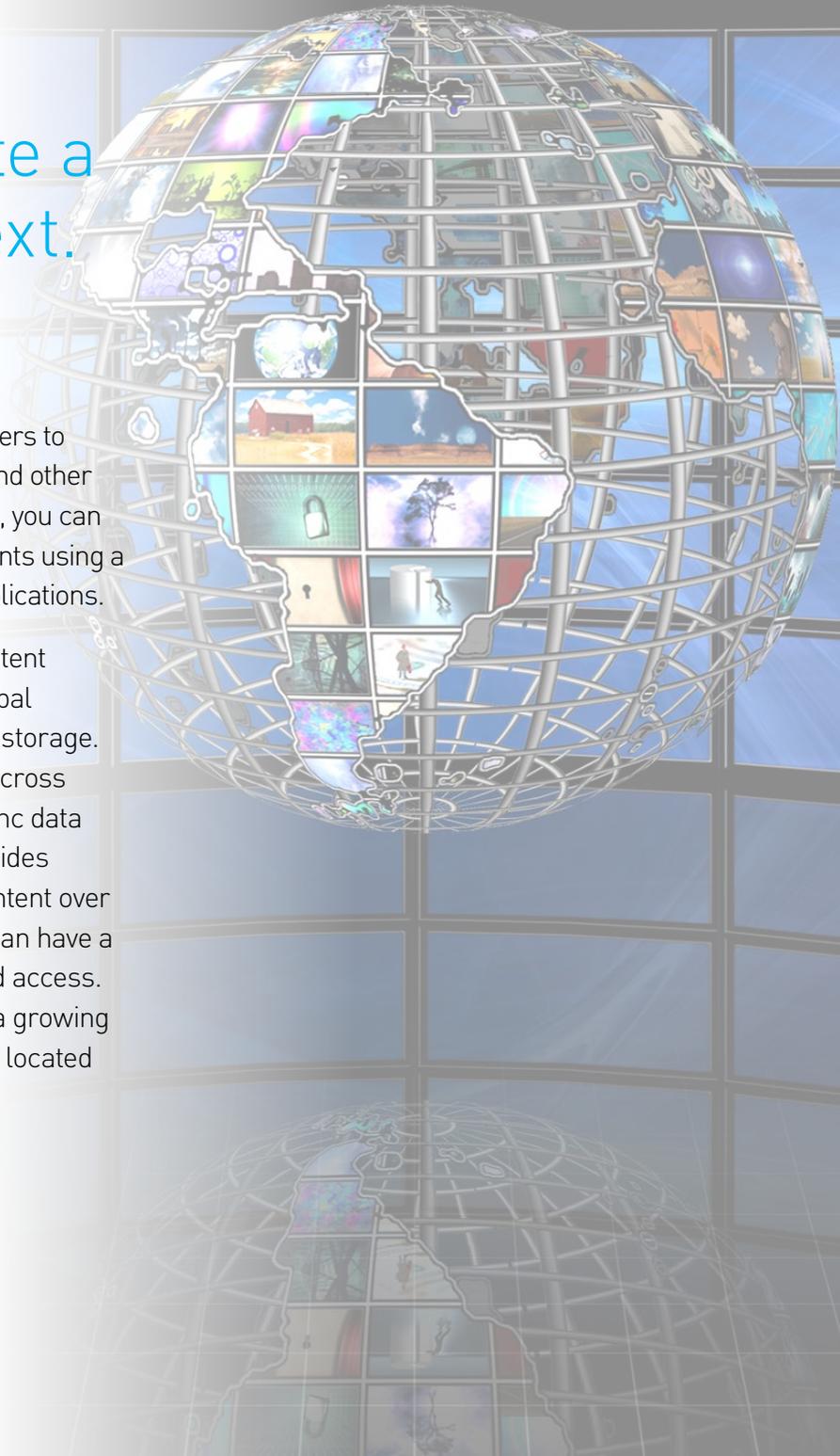
To enhance the efficiency of workflows and facilitate collaboration among team members, storage solutions must enable simple, flexible access to content. Your team members should be able to work with the content they need using their preferred applications and workstations—they shouldn't have to learn new tools or give up familiar environments. Just as important, they should be able to access content no matter where they are located, whether they are down the hall in an edit suite or working from a remote location across the globe.

Storage solutions must also have the flexibility to accommodate increasingly complex workflows. Today's content is sent through a growing number of stages between ingest and completion—and each stage has its own performance and capacity requirements. Post-production technology teams must be able to support these new stages without having to make significant changes to their storage environment.

ACCESS AND COLLABORATION

The StorNext file system facilitates collaborative workflows, allowing users to directly access video files, images, and other content at high speed. With StorNext, you can support multiple computers and clients using a variety of operating systems and applications.

StorNext simplifies sharing and content distribution by creating a single, global namespace across multiple tiers of storage. And it can extend that namespace across multiple data sites using the FlexSync data replication capability. FlexSync provides lightning-fast synchronization of content over a WAN to other sites so that users can have a local copy of the data for high-speed access. As a result, you can accommodate a growing team of workers, wherever they are located around the world.



ARCHITECTURES AND CONNECTIVITY

StorNext also offers the flexibility to support several types of storage systems and connectivity options. A storage solution powered by StorNext can be architected to precisely align to the unique performance and capacity requirements of your business. You can support end-to-end workflows and integrate new types of storage easily.

For example, you can deploy shared storage area network (SAN) environments that use Fibre Channel connections for processing and delivering data frames at a guaranteed speed in guaranteed order. In addition, you can implement a scale-out network-attached

storage (NAS) gateway to provide affordable shared Ethernet access to a single pool of high-speed storage. StorNext also features an optional IP-based block-based Distributed LAN Client (DLC), which provides guaranteed in-order frame delivery over 1 GbE, 10 GbE, and 40 GbE connectivity.

By allowing data to be accessed across NAS as well as shared SAN connections, StorNext serves a full range of media workflow functions. You can support everything from editorial operations that require high streaming performance to rendering, transcoding, and other operations better suited for running across IP connections.

PROVIDING FLEXIBLE SHARED ACCESS TO CONTENT FOR SPORTS VIDEO PRODUCTION

Background: Ole Miss Sports Productions generates engaging content for the University of Mississippi's 14 Division I NCAA teams. When its existing storage environment began to fail, the organization turned to media workflow experts at 1303 Systems to design a new solution.

Challenge: The video production team needed storage that could deliver continuous uptime, scalability, consistent performance, and fast, simultaneous access to content. Multiple editors often work on the same content at the same time.

Solution:

- Quantum StorNext file system
- Quantum Xcellis® workflow storage
- Quantum QXS™ storage arrays
- Western Digital object storage archive
- 1303 Crucible media asset management (MAM)

Benefits:

- **Boosted editor productivity** by enhancing storage reliability.
- **Facilitated efficient collaboration**, providing fast access to shared content.
- **Accelerated end-to-end workflows** from ingest and post-production to delivery.
- **Gained scalability for future growth** with seamless expansions and integrations.

“ Our productivity is at an all-time high because our editors don't have any downtime. They're able to access and view everything on our system without any hiccups. ”

Stewart Pirani
Manager of Creative Services,
Ole Miss Sports Productions

Read the full case study:
www.quantum.com/olemiss



BALANCE:

BOOST PERFORMANCE AND
CAPACITY WHILE CONTROLLING
COSTS USING WORKFLOW-
OPTIMIZED STORAGE

Build an end-to-end environment and optimize storage resources with automated data movement.

Media and entertainment organizations regularly identify performance, capacity, and cost among their top storage concerns.¹ How can your organization successfully balance performance, capacity, and cost when selecting and implementing a storage solution?

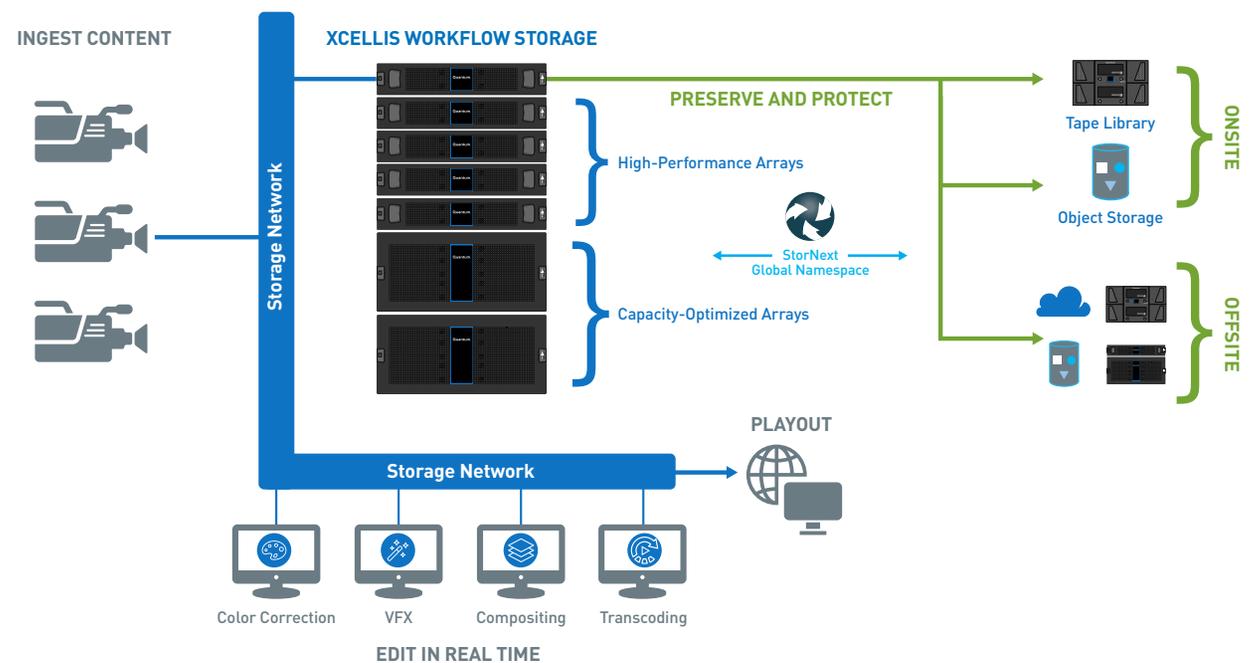
Having an effective archive strategy in place is a key piece of the puzzle. The right archive strategy can help improve the overall economics of your end-to-end storage environment. Consider the cost difference between storing 1 PB of data on data tape compared with storing the same amount of data on flash: The flash drives could cost 30 times as much.

But you must do more than purchasing a tape archive. You need a storage platform that can integrate all of your storage tiers, from your primary storage through object storage, tape, and cloud environments. The platform should automate data management, moving files to the right tier according to your pre-defined policies. And the platform should enable users to see and access data no matter where it resides in your multi-tier environment.

MULTI-TIER INTEGRATION

StorNext can help you achieve the right balance of performance, capacity, and cost in a multi-tier environment. With StorNext, you can seamlessly integrate multiple types of storage, from Tier 0 flash-based storage through object-based systems, data tape archives, and cloud archives. You can use flash-based storage to rapidly ingest content

from numerous devices and to deliver a responsive experience to team members working on multiple streams of high-resolution media. You can then use object-based storage for data protection and active archiving, tape for longer-term, cost-effective archiving, and cloud storage for content you will not need to retrieve quickly.



StorNext enables you to create an end-to-end storage environment, such as this one for sports video.

¹See, for example, Quantum and postPerspective, "Post-Production Storage Trends for 4K Video Content," 2018, <https://www.quantum.com/en/landing-pages/PostPerspective-4k-Survey-Ebook>

AUTOMATED DATA MOVEMENT

The Storage Manager tool provided with StorNext automates data movement across multiple tiers according to your policies. Content for current projects can stay on high-performance arrays. You can use capacity-optimized primary storage arrays for content that is being accessed for offline editorial. Older, less-frequently accessed content is moved to more cost-effective media.

StorNext also extends the ability to dynamically place data where and when it is needed most within the primary tier. StorNext does this by manipulating the affinity state on files and directories, and

moving file content among different stripe groups associated with the affinities. All data movement is achieved through rule-based jobs that define the set of content to be processed and the action to be performed.

By creating a single-namespace environment, StorNext makes it easy to find and access content regardless of where it resides across multiple tiers. Tiering capabilities do not change the file system namespace or any other aspect of files except the location where file content resides—tiering is completely transparent to users. Users can access files directly through the file system or through an integrated MAM system.

CONSOLIDATING IT WITH AN END-TO-END QUANTUM SOLUTION

Background: Hogarth Worldwide is a fast-growing global business that produces advertising and marketing content for some of the world's leading brands.

Challenge: Hogarth had been using Quantum StorNext for its broadcast business for many years. A recent IT consolidation initiative led the company to search for a single storage platform that could be used as a standard across all business divisions.

Solution:

- Quantum StorNext file system
- Quantum Xcellis workflow storage
- Quantum QXS storage arrays
- Quantum Lattus® object storage

Benefits:

- **Consolidated IT** by standardizing on flexible, end-to-end Quantum solutions.
- **Simplified deployment** and boosted security by selecting Ethernet-ready storage.
- **Delivered a responsive user experience** and facilitated team collaboration.
- **Gained flexible backup capabilities** with high-performance block storage.

“With StorNext and Storage Manager, we can implement a very flexible data protection model that taps into the performance and scalability of object storage.”

Steven Butler
Production Technology Director,
Hogarth Worldwide

Read the full case study:
www.quantum.com/hogarth

A photograph of three business professionals in an office setting. A man with a beard and a woman are seated at a desk, looking at a laptop screen. A man with glasses and a beard is standing behind them, also looking at the screen. The scene is dimly lit with a purple hue. The text is overlaid on the image in a bold, white, sans-serif font.

STREAMLINED MANAGEMENT:
SIMPLIFY ADMINISTRATION
OF INCREASINGLY COMPLEX
ENVIRONMENTS

Manage a complicated environment with a small staff using StorNext.

In the past, storage management was assigned to a team of IT administrators who would use a command line interface. Today, many organizations have reduced their IT administration headcount and rely on a small team—or even a single person—to manage large, multi-tier, multi-petabyte storage environments.

Of course, even if your organization has a single administrator assigned to storage, you still have high expectations for system availability. Time is money, and tight production deadlines are non-negotiable, so you need to do everything in your power to minimize downtime.

Meanwhile, you also need the agility to handle new requests and changing requirements. If your organization wins the bid for a large, new project, you might need to scale the environment to support growing volumes of content and additional

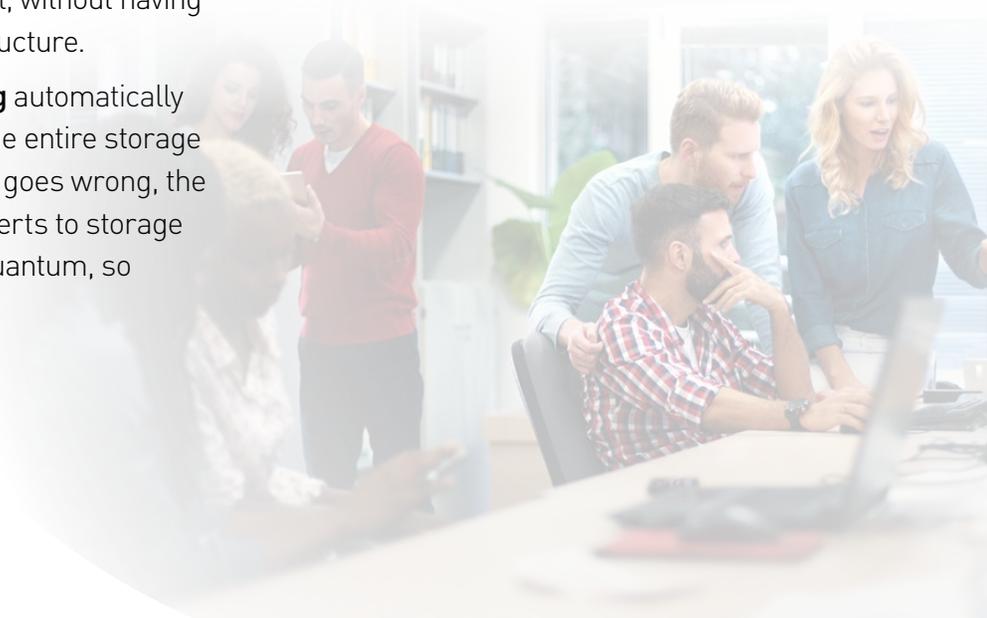
users. Or you might need to implement new applications that can enhance creativity and productivity.

StorNext helps streamline storage administration, so you can successfully manage your entire multi-tier environment and respond to new requests, with a small staff or even single person. Quantum continuously enhances the StorNext graphical interface and management capabilities, adding new features to further simplify management. For example:

- **Remote management capabilities** enable administrators to manage the environment from a simple web portal, without having to be local to the infrastructure.
- **Cloud-based monitoring** automatically monitors the health of the entire storage environment. If anything goes wrong, the monitoring tool sends alerts to storage administrators and to Quantum, so

Quantum and its customers can work together to address any issues rapidly.

- **Analytics tools** help identify potential bottlenecks between clients and the shared storage environment so they can be quickly resolved.
- **Tools for quickly mounting NAS clients** are available through an easy-to-use interface.





SUPPORT EVOLVING MEDIA WORKFLOWS WITH STORNEXT

With increasing demand for captivating, high-resolution content, your media workflows are changing. These changes will make it difficult for traditional storage solutions to meet the basic requirements of rapidly ingesting data, providing easy access to data, and preserving data for the long term.

Quantum solutions, powered by StorNext, offer a modern platform for today's evolving workflows, and with it, you can achieve the performance, flexibility, and workflow optimization you need while controlling administrative complexity.

Ready to Learn More?

To learn more about Quantum solutions for media and entertainment, visit www.quantum.com/media-and-entertainment

To explore the file system that sets Quantum apart, visit www.quantum.com/stornext

Quantum.

Quantum technology and services help customers capture, create, and share digital content—and preserve and protect it for decades at the lowest cost. Quantum's platforms provide the fastest performance for high-resolution video, images, and industrial IoT, with solutions built for every stage of the data lifecycle, from high-performance ingest to real-time collaboration and analysis and low-cost archiving. Every day the world's leading entertainment companies, sports franchises, research scientists, government agencies, enterprises, and cloud providers are making the world happier, safer, and smarter on Quantum. See how at www.quantum.com.