

Scaling Anywhere with Qumulo

TOM COUGHLIN, COUGHLIN ASSOCIATES, INC. | MARCH 2024

Changes in Media and Entertainment Workflows

Media and Entertainment content storage requirements are increasing as higher resolution, higher dynamic range, higher frame rate content becoming more common and with more cameras used in many M&E projects. For instance, in sports broadcasts, there may be many 4K or even higher resolution cameras used to capture all the action on the field.

Likewise, special effects and rendering must increase the richness of their generated images to match the quality of native video quality. Production with more and larger files requires storage system management that can support greater scale.

Coughlin Associates estimates that 2024 professional media and entertain storage growth will be over 180 Exabytes for all types of M&E storage, including local and cloud-based storage. This growth could increase to over 300 Exabytes within three years. Local network storage growth is estimated to be over 68 Exabytes and cloud-based storage growth over 63 Exabytes in 2024. There is also demand for direct attached storage as well as object storage for various M&E applications.

90% of all data is unstructured data, such as video and audio content. Unstructured data is doubling every 18-20 months. This data is increasingly spread around many different locations, including on-premises, at edge locations (such as a TV production truck) as well as in the Cloud. 82% of IT leaders have adopted a hybrid cloud strategy that used local as well as remote storage for their operations, including in media workflows

The COVID pandemic showed that many M&E activities could be done remotely, using content in the Cloud for collaborative work. This accelerated a trend that has been developing over the last decade or more, and today remote work and international collaboration are major elements in many M&E workflows. At the same time, there is greater pressure than ever before for increased productivity and efficiency with lower costs.

While block-based and object storage are used for some M&E activities, file-based workflows predominate. This is true of both local and cloud-based storage in M&E. Many media organizations use both local storage as well as their own or public cloud storage to enable collaborative editing and other activities.

These hybrid cloud approaches provide ready access to content, but there are challenges in providing and accessing digital storage at scale as media content grows. Cloud storage may be used for specialized operations on particular clouds (multi-cloud) or for cloud bursting, where a facility uses cloud-based resources to augment local resources when demand gets too high. In addition, most M&E workflows are file-based, while many clouds use object storage.

Having rich media content in many locations, on-premises, at the edge or in one or more clouds complicates the management of this content and can prevent realizing the content's full potential. It can also slow down collaboration and limit the improvements in efficiency and economy that modern workflows require. What is needed is a solution that can manage file-based content where ever it lives and can scale with the growth in the number and size of these files.

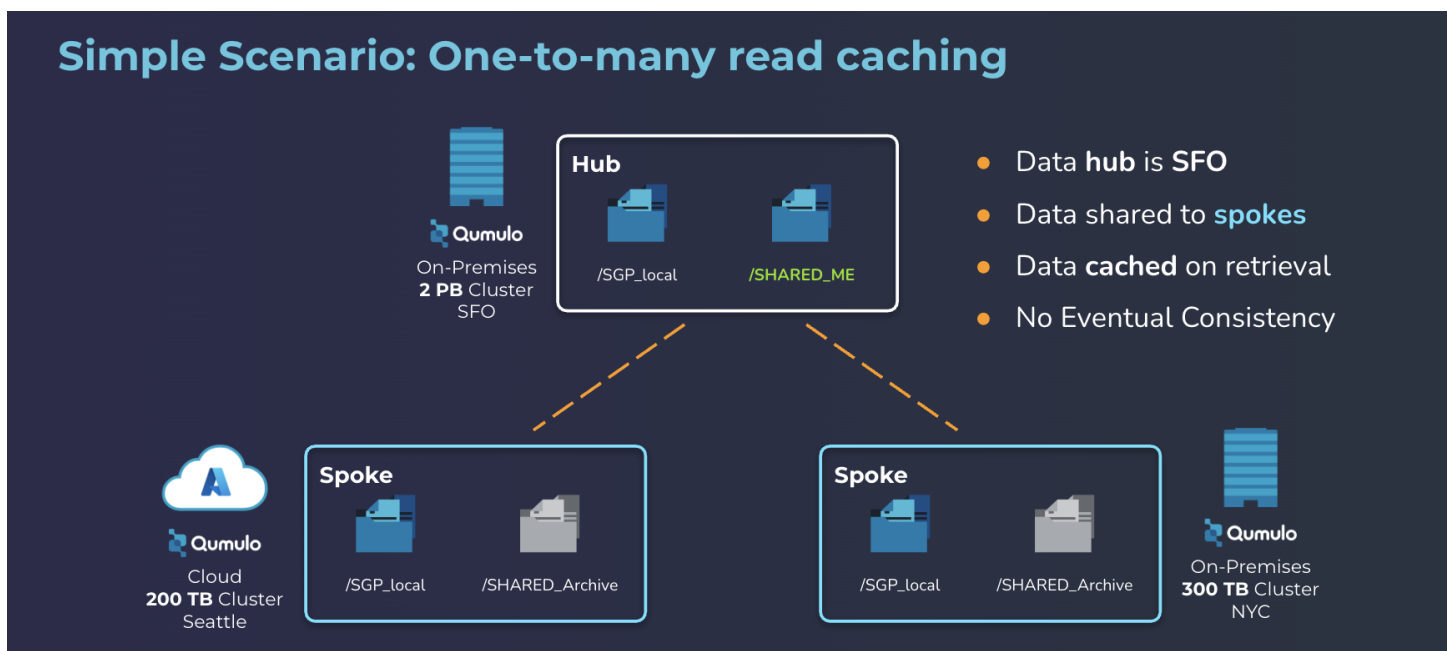
Qumulo

Qumulo has been a leader in file-based storage since 2012. The company has over 900 customers worldwide, with over 3 Exabytes of licensed storage. Qumulo's growth to 3 Exabytes of storage happened 7X faster than its growth to its 1st Exabyte. On average, Qumulo customers have over 1 Petabyte of data, create over 1 billion files, and perform over 200 billion operations, with 90% of those operations taking less than 1 millisecond.

In December of 2023, Qumulo launched a new paradigm in unstructured data called Scale Anywhere, which is intended to host all of a customer's unstructured data, wherever it needs to be, and on the customer's terms. Important aspects of this announcement include Qumulo Global NameSpace, Nexus and Qumulo One. In addition, Qumulo co-developed Azure Native Qumulo (ANQ) with Microsoft.

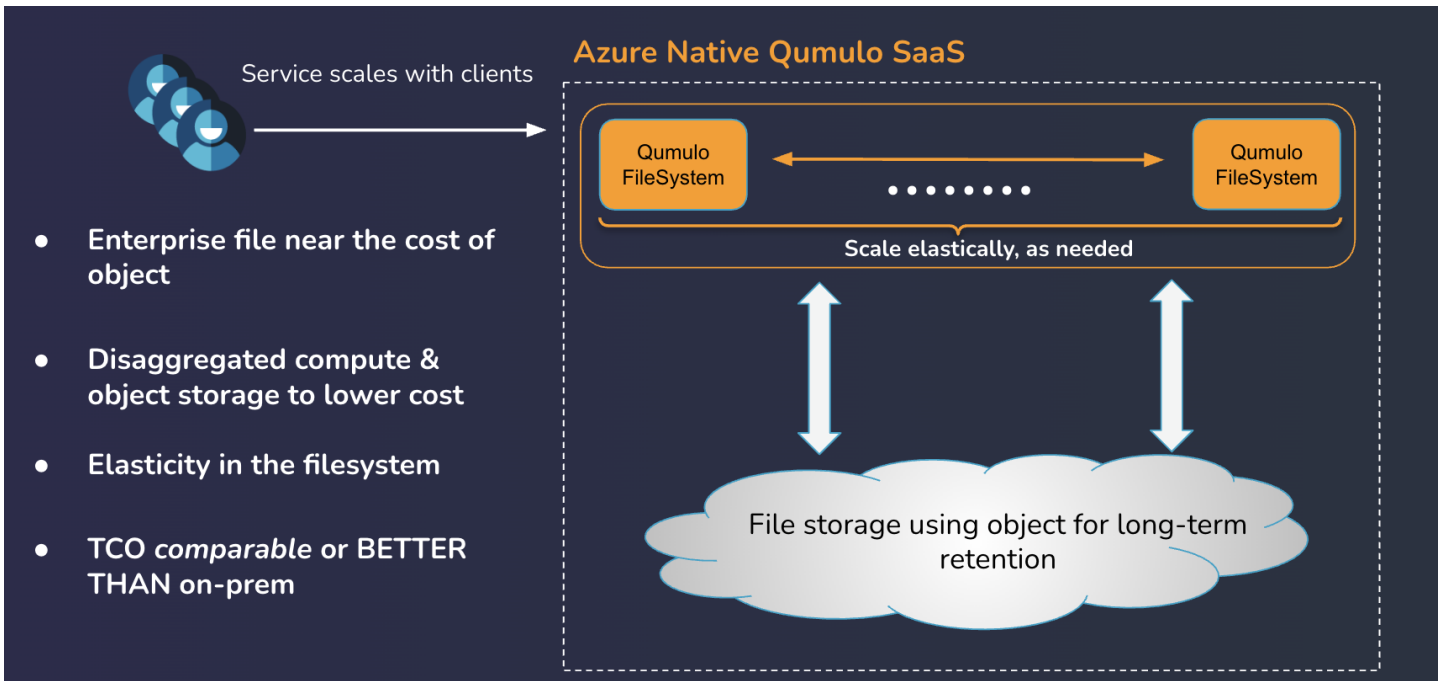
Qumulo Global NameSpace (Q-GNS) allows users and applications to access geographically dispersed data as though it were local, through a unified data plane across all Qumulo environments. Nexus is Qumulo's universal management platform. It provides single pane of glass management of all aspects of Qumulo's Scale Anywhere platform with real-time analytics on data wherever it lives.

Q-GNS allows one-to-many data availability. So, for instance, a data hub (SFO) can share data to remote spoke sites, with each site receiving consistent updates as shown below. Q-GNS also allows tiering to Active Archives, from which the hub can access and share content as needed from less expensive storage. Q-GNS enables follow-the-sun production pipelines, including remote editing, M&E burst rendering in the Cloud, combined with data management, data analytics and various types of artificial intelligence in the Cloud.

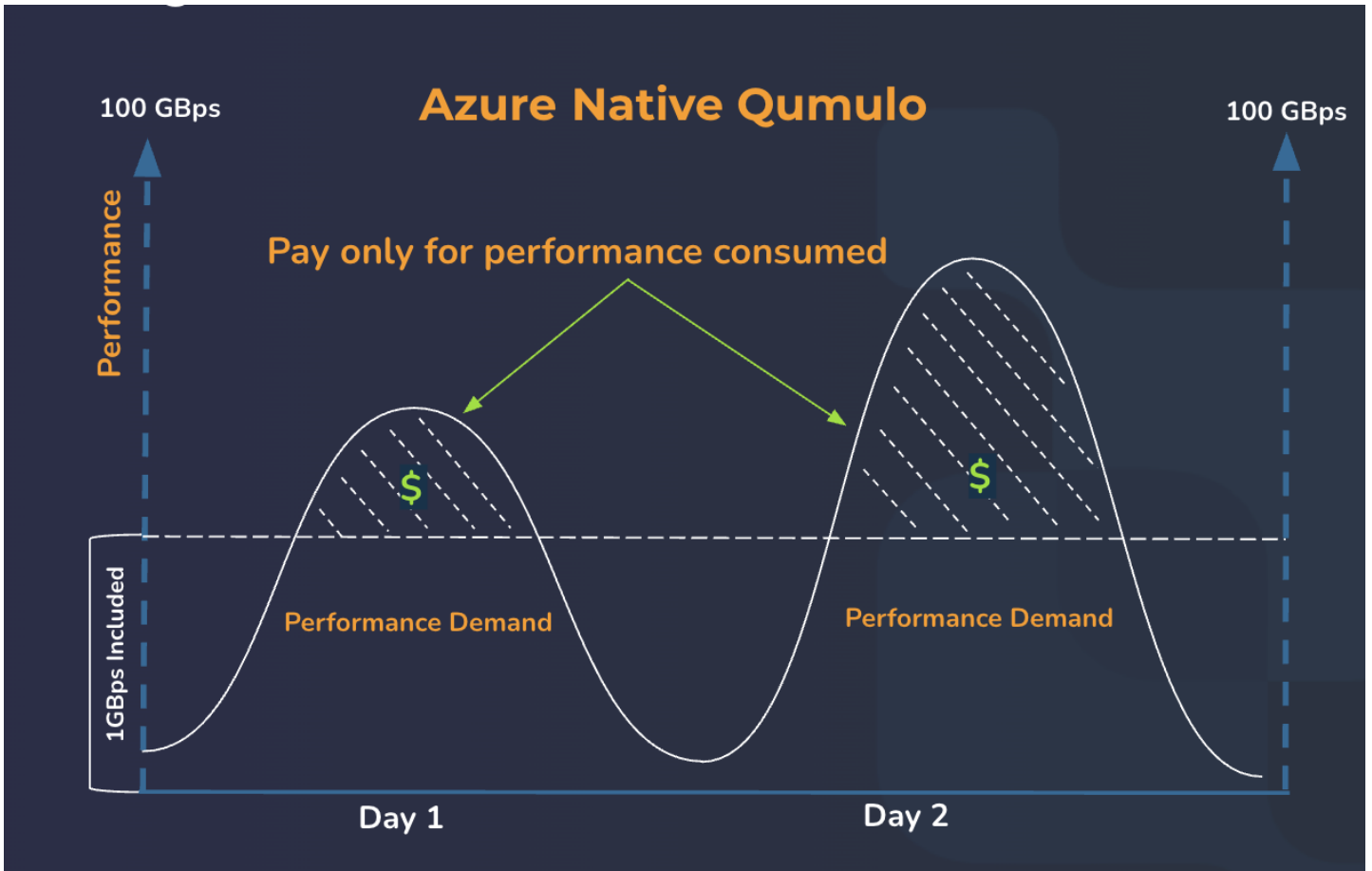


Qumulo can run on any data center hardware platform. Customers can utilize standard hardware form factors that include low cost as well as high performance of all NVMe platforms at their data center or edge locations. Qumulo One is an all-in-one pricing plan allowing customers to pay for all their Qumulo environments based only on consumption, with built in discounts provided automatically as the size of datasets scales.

Azure Native Qumulo (ANQ) is a native file service running on Azure, providing cloud file storage that combines the scale, durability, and elasticity of Azure Blob with the performance, data services and protocol compatibility of the industry's leading file system. The image below shows how file caches on Azure object storage can be used to provide file-based access with content stored in low-cost object storage. ANQ costs 80% less than other native file service solutions.



Rather than overprovisioning storage services and paying for additional storage performance even when it isn't needed, as the image below shows, ANQ lets users pay for additional performance only when they need it.



Cinesite Case Study

Cinesite Studios is using Qumulo to accelerate the production of motion pictures with cloud rendering. Cinesite is a leading digital entertainment studio, having produced animated feature films such as *The Addams Family*, *Extinct* and *Riverdance* as well as VFX products for *The James Bond* movie franchise, *Avengers: Endgame*, *Rocketman*, and the *The Witcher*. The studio has over 1,000 employees in offices in London, Montreal, Berlin, Munich and Vancouver.

Qumulo and AWS enabled Cinesite to leverage high-performance storage at scale with controlled costs that avoided overprovisioning and enabled effective cloud-bursting. As a result, Cinesite is serving its current customer needs, but also developing scalable 16K video workload capabilities for future customer requirements. Cinesite has also been able to use Qumulo's global namespace to rapidly exchange data all over the world and make the best use of their far-flung workforce.

Qumulo is working with Cinesite to use AI for predictive block as well as file access between locations, for intelligent caching and to enable even more responsive scaling everywhere. Cinesite said they render in 2K with a push to 4K and they do marketing stills at 2K, 4K or 8K.

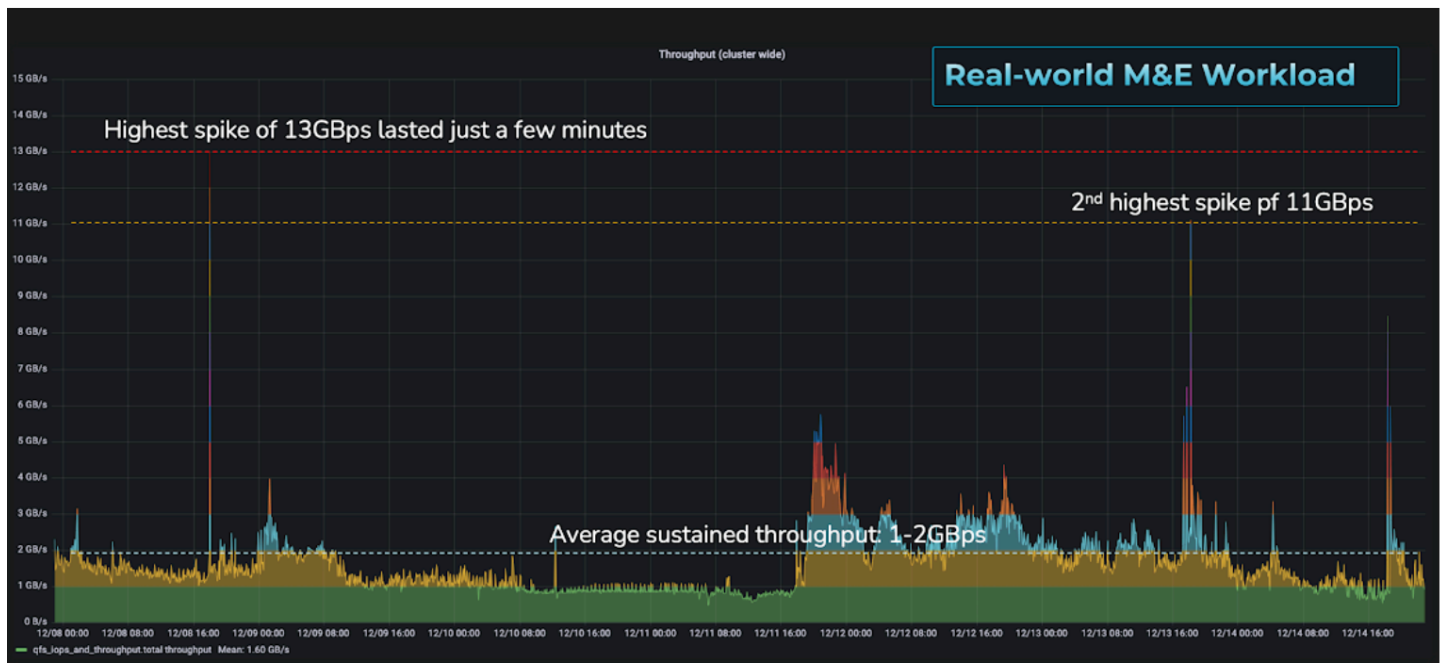
The image below shows an example of a real M&E workload, showing occasional spikes in performance demand, which Qumulo cloud storage was able to support. The customer gets the storage performance they need when they need it, and only pays for higher performance when they use it. In addition to cloud rendering, Qumulo also makes it easier to use excess capacity in-house in different locations to improve workflows.

Cinesite used Qumulo on AWS, leveraging Amazon EC2 and EBS to provide the cloud-bursting scale that Cinesite required. In particular, Qumulo cloud storage helped Cinesite move their workload to AWS US East (Virginia) from a smaller region to achieve the rendering performance scale they needed. Cinesite experiences consistent performance of at least 20GB/s bursting to 20-2,000 high-quality render nodes on AWS with Qumulo. These nodes can be spun up in minutes and torn down just as quickly. This enabled big changes in scheduling and forecasting project pipelines, enabling more certain schedules.

Qumulo's global namespaces with security and access control provided the safe and easy international content exchanges that Cinesite needed for its workflows. In addition, Qumulo provides support for disaster recovery (DR) storage using fast replication from its production storage, and paid for with the same Qumulo license. Cinesite has 30+ PB of storage across production, archive and cloud storage globally.

Qumulo has also been very responsive to Cinesite's needs, and Cinesite said Qumulo provided direct support, without a middleman. At one point, the Cinesite technical team had to solve a pressing problem in the early morning and reached out to Qumulo's customer success team. Within sixty minutes, the Qumulo team responded with suggestions for configuration changes that would improve network performance. Cinesite implemented these changes and got the performance it needed for its media projects.

Anonymized example of M&E workload variability



Summary

Qumulo Scale Anywhere allows performant elastic file access to support modern M&E workflows. Important elements of Qumulo's offering are its Global NameSpace, Nexus and Qumulo One. Qumulo provides file storage management that spans on-premises, enterprise edge and cloud storage. The company announced its Azure Native Qumulo (ANQ) with Microsoft, expanding its cloud coverage.

Qumulo supports hybrid M&E workflows that enable studios to provide performant distributed media environments that enable elaborative editing, animation and VFX rendering using local storage as well as fast and efficient cloud bursting with charges only for the additional performance, when it is needed, and with continued work to improve remote data access with anticipatory file caching.

Qumulo provides support for remote disaster recovery and production storage with fast data replication and using the same license with excellent security and access controls, tailored for the M&E industry. Using Qumulo Scale Anywhere, studios can move data fast and seamlessly, and enable rendering nodes to meet their needs when and only when they need it. In addition, Qumulo provides direct and fast customer support.

Cinesite Studios was able to use Qumulo to solve their production problems and create cost effective cloud bursting for rendering animation and special effects, serving offices spread between several locations in Europe and Canada, and enabling greater efficiencies and more effective use of their global workforce. Cinesite also found Qumulo responded rapidly to problems, helping them achieve their production goals.

For detailed technical specifications, implementation strategies, or to schedule a demo, contact info@qumulo.com.