CASE STUDY

Qumulo and Fralin Biomedical

Qumulo Helps the Fralin Biomedical Research Institute (FBRI) Create a Healthier Future for Everyone

FBRI simplifies its data environment, eliminating data silos and accelerating performance, with Qumulo's file data platform

Research institutes are in the business of research, not managing infrastructure. They need ready access to all of their data, the ability to share results with other researchers, and confidence that their valuable information is protected. Fralin Biomedical Research Institute (FBRI) at Virginia Tech Carilion (VTC) faced challenges with its demanding biomedical research that the institute's legacy system couldn't handle, but Qumulo could.

The FBRI is Virginia Tech's biomedical research institute. Partnering with the university and Virginia's Carilion Clinic, the research institute is based at Virginia Tech's Health Sciences and Technology campus in Roanoke.

The FBRI opened its doors in September 2010, and over the past decade produced critical biomedical research advancements and trained the next generations of leading biomedical scientists. Today, research areas include biomaterials, body device interfaces, brain research, cancer, cardiovascular science, infectious diseases and immunity, metabolism and obesity, addiction recovery, and children's health.

The research institute grew quickly, doubling in size over ten years. On top of fast growth, the FBRI plans to add over 25 new core research groups over the next three to five years. To meet its huge current and future research needs, the FBRI needed to evolve well beyond its legacy storage system.

"Data is the currency and lifeblood of scientific research. We needed to respond to the concerns of exponential data growth, how to store and present data in an intuitive and non-intrusive way, and how to manage and protect stored data without impacting daily operations."

– Jason Krisch, Director of IT
FBRI at VTC

Limited Legacy

The FBRI's legacy environment was a proprietary block storage system that had only 250TB of capacity. The team had to use quotas and off-load data to external data silos to create space for active workloads and in-flight scientific projects. Data was stored in multiple systems, some planned and some not. Windows workstations, Linux machines, and Macs complicated data movement and sharing, while backup and archival data were stored in tape libraries and nearline disk.

While the institute never experienced any data loss, data protection was a constant concern and was consuming a lot of the FBRI staff's time. So was the issue of business continuity: it was impossible to capture the rapid point-in-time changes common in the environment.

FRALIN BIOMEDICAL RESEARCH INSTITUTE AT VTC
VIRGINIA TECH

Business Outcomes from Moving to Qumulo:

Eliminated data silos for faster performance.
The FBRI had data in multiple data silos, which complicated data management and made it difficult to access files at the pace researchers were working. The Qumulo file data platform enabled IT to consolidate the data silos into a single system, which made data sharing simple and provided the performance levels that the research groups needed.

Protected critical data.
Instead of trying to protect data on multiple systems with multiple tools, the FBRI centralized its data protection on a new file data platform. The Qumulo file data platform automatically protects petabytes of unstructured file data, virtual machines (VMs), active project data, analytics, and more with both snapshots and remote data replication to a secondary university site.

Next-generation performance.
The FBRI plans to add over 25 new core research groups over the next few years. To power new levels of performance and data growth, the research institute is taking advantage of the performance of all-NVMe nodes in its file data platform to meet the demands of its state-of-the-art scientific facility.

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The Solution: Qumulo's File Data Platform

Qumulo's file data platform was the answer. It met all of the FBRI's needs for simplicity, flexibility and performance.

Groundbreaking Change

Replacing aging file servers was the immediate priority. The FBRI needed a centralized data system that provided access to all its different platforms and optimized storage for a wide variety of unstructured data.

The primary Qumulo cluster leveraged snapshots for real-time protection, a significant improvement over backup disk and tape storage. Automated snapshots capture all data including the VM environment and unstructured data. Snapshots also protect critical active project data and real-time analytics.

Comprehensive Data Protection

To further strengthen its data protection, the team added active archive clusters for remote replication to the main campus data center.

Krisch said, "Setup was simple. As soon as it was up, Qumulo immediately started real-time replication of one hundred percent of our data from our Roanoke facility to the cluster in Blacksburg."

"Our scientific findings are priceless, and our data is irreplaceable. With Qumulo, I know it's fully protected."

– Jason Krisch, Director of IT
FBRI at VTC

High Visibility and In-Depth Analytics

Visibility and analytics are also crucial for optimizing a storage environment. Qumulo's easy-to-use analytics dashboard breaks down usable capacity views into data, metadata, and snapshots. Admins can view the last 24 hours of real-time read/write activity and peaks, the client machine count, and capacity changes over a specific period – for up to 52 weeks.

Admins can also view current activity in top clients and see real-time throughput hotspots in the file system. Analytics enable the FBRI to optimize its site-to-site replication and failover preparation.

Proactive Customer Support

Customer support proved to be a critical advantage. "Qumulo support has been a real win for us," Krisch noted. "In our industry, downtime is unacceptable. Thanks to Qumulo and its customer service, we never have to experience that."

Proactive, expert customer support enables Qumulo to quickly evolve its file system and implement new capabilities to support research creativity and innovation.

Simplicity

The institute's IT team seamlessly moved all their project data, archival data, lab data, unstructured data, administrative data, and VM data to the Qumulo platform. In place of time-consuming file servers, Qumulo created a centralized location where it would be easy to locate and retrieve unstructured data from projects and labs. Multi-protocol support also simplifies management and user support. Qumulo's single platform works seamlessly with different protocols for Linux, Windows, and Mac workstations.

Performance

Storage, compute, and networking performance is extremely high with Qumulo's file data platform. Current connectivity is 40Gb between storage, compute, and the network: a dramatic increase over the 8Gb Fibre Channel the FBRI used with its legacy block storage. And 40Gb is just the beginning. The FBRI is building a new scientific compute environment with Qumulo and 100Gb connectivity between storage and compute.

Qumulo's file data platform moves data quickly within the data center, between remote data centers, and in the cloud. Robust scale-across features enable the Qumulo platform to securely share data at high speeds across cloud services.

A Promising Future

A new 140,000 square foot facility in Roanoke will house the FBRI's state-of-the-art data center for scientific workloads. Administrative workloads will stay on the Qumulo 1.9PB cluster.

The IT team purchased four nodes of Qumulo NVMe all-flash storage for the new facility. The all-flash storage and 100Gb connectivity will enable the FBRI to make even more advances in research, and to make them faster than ever before.

"The FBRI will continue working with human health. We'll go deeper into genomics and complex imaging. We're adding more functional magnetic resonance imaging, CT scanners, and PET scanners into the new facility. This expansion translates into more data, more analytics, and more processing. We can confidently do all that on Qumulo."

– Jason Krisch, Director of IT
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