



Success Story

ITMI Accelerates Research Results with Private Cloud on NetApp



Another NetApp solution delivered by:



KEY HIGHLIGHTS

Industry
Research

The Challenge

Conduct more research; speed time to discovery for large and novel genomic and clinical data studies.

The Solution

Deploy NetApp® E-Series and EF-Series storage systems in a private cloud environment.

Benefits

- Speed up dataset analysis from weeks to hours to accelerate breakthroughs
- Create dimensional visualizations to uncover new connections and trends that could lead to better disease treatments and prevention
- Triple HPC capabilities to support genomic studies for preterm birth and other newborn disorders

Transforming healthcare with groundbreaking research

As an institute of Inova, a not-for-profit healthcare system based in northern Virginia, Inova Translational Medicine Institute (ITMI) is individualizing patient care through genomics and molecular medicine. By leveraging technological innovation, advanced research, and sophisticated information management, ITMI is unlocking the secrets of RNA and DNA to better treat and prevent disease.

The Challenge

Support for more studies

Three years ago, ITMI began its first genomic study on preterm birth to help identify, better care for, and even develop preventive therapies for at-risk mothers. Since then, ITMI has initiated several other major studies, with more in the pipeline. For each study, massive amounts of information are collected, merged, and analyzed from different sources. The information comes from including the Inova Epic electronic health record and patient portal, whole genome sequences, and other biological and clinical data sources. Initially, everything was stored and managed within a public cloud. However, as more researchers and clinicians began examining and manipu-

lating ITMI's growing datasets, storage costs and pay-per-use fees became increasingly steep.

Seeking a more viable IT strategy to support its mission, ITMI elected to move to a hybrid cloud environment. With full control over an internal infrastructure, ITMI saw private cloud as a means to more reliably and cost-efficiently address rapidly escalating performance and capacity demands.

ITMI consulted with NetApp sales and engineering teams, who recommended an integrated NetApp and SGI infrastructure stack to meet the institute's high-performance computing (HPC) needs. The operational and management efficiency of the solution also offered a lower TCO than did the competing solutions that ITMI was considering. A NetApp Professional Services Certified Partner, ePlus, was engaged to deploy the new ITMI private cloud infrastructure at one of Inova's hospitals.

"We chose to work with NetApp to deliver a cost-effective platform that provides the power and agility needed to accelerate our time to discovery," says Aaron Black, director of Informatics at ITMI.

The Solution

An on-premises supercomputing environment

Following its preterm birth study, ITMI launched a second, multigenerational genomic initiative. This study focused on the genetic markers that may someday help predict and prevent childhood diseases and disorders such as asthma, obesity, and autism. It is the first study supported by the ITMI private cloud environment.

Chosen for high reliability, price for performance cost-efficiencies, and seamless scalability, eight Linux®-based servers were deployed. These servers are attached to NetApp E-Series storage systems and support the ITMI Microsoft® SQL Server® back-end databases, which form the foundation for research efforts.

The SGI UV 2000 server infrastructure at ITMI has 32 blades and 16PB of global shared memory. It seamlessly interfaces with the NetApp E-Series systems, connecting over both 1GbE and 10GbE networks through Cisco Nexus® and Catalyst® switches by using the NFS protocol. Together, the components support a wide array of bioinformatics tools and PBS Professional HPC workload manager software. The high-powered, highly automated infrastructure is accelerating time to discovery by processing more data at a faster rate—and with greater quality control.

“It used to take weeks to analyze some datasets in the public cloud, and processes often failed halfway through,” says Black. “With NetApp E-Series storage and SGI servers supporting our private cloud, we now have the reliability and processing speed to complete studies in hours—and for a fraction of the cost of using public cloud resources.”

ITMI also purchased an all-SSD NetApp EF-Series flash array. ITMI will use it to create interactive visualizations from billions of data points, which would take

too long to render by using traditional reporting methods. “With the NetApp EF-Series, we can manipulate data faster and in new ways, which helps us uncover connections and trends that might not be visible with traditional analysis alone,” says Black.

NetApp SANtricity® Storage Manager software facilitates extensive configuration flexibility and custom performance tuning. With this software, ITMI can maximize performance and utilization for its E-Series and EF-Series systems.

ITMI also needs fast and reliable storage to move large amounts of data between its internal compute resources. For efficient testing and development, ITMI is leveraging a NetApp FAS3250 storage system that runs the NetApp clustered Data ONTAP® operating system.

Business Benefits

Room to grow

With the ability to efficiently deliver HPC resources on demand, ITMI can quickly launch new studies, including genomic studies and other investigations for health issues such as heart disease, diabetes, and cancer.

“NetApp technology opened the door to more studies and tripled our HPC capabilities,” says Black. “When experts can quickly access and analyze multiple datasets simultaneously, correlations may appear that could lead to new discoveries.”

Opening up a world of possibility

Providing the best treatment at the right time to the right patient can transform and save lives. ITMI’s genetic research is helping revolutionize the practice of medicine by changing it from reactive to predictive. NetApp E-Series and EF-Series systems, along with and SGI servers, support that effort. ITMI can now turn data pools that will eventually comprise tens, and maybe hundreds, of petabytes of raw data into empowering insights faster than ever before.

“We have supportive, ongoing collaboration with NetApp,” says Black. “Our NetApp solutions will continue to grow as we do, enabling us to conduct more studies to deliver even greater value to the biomedical community in their search for answers.”

SOLUTION COMPONENTS

NetApp Products

NetApp E5500 SAN systems, EF540 flash array, and FAS3250 storage systems

NetApp SANtricity Storage Manager software

NetApp clustered Data ONTAP

Environment

Applications: Epic, Illumina Bioinformatics, and PBS Professional

Database: Microsoft SQL Server

Servers: SGI UV 2000 server infrastructure

Operating system: Linux

Protocol

NFS

Partner

ePlus

www.eplus.com



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