



NetApp High-Performance Computing Solutions for Labs

BACKGROUND

Scientists around the globe are pursuing discoveries that will enhance national security, increase our knowledge of the universe, and solve some of the world's most critical challenges.

Turning experiments into groundbreaking discoveries requires a combination of smart scientists and modern technology. Whether they're working to find sources of renewable energy, better understand the evolution of our universe, create new materials, or cure cancer, researchers need a lightning-fast, highly reliable IT infrastructure to process, store, and analyze the massive amounts of data generated by each project.

CHALLENGE

For researchers, time in the high-performance computing (HPC) environment is precious. Downtime can derail years of research and waste untold resources, so the infrastructure must be extremely fast and highly available. As data grows exponentially, labs must be able to quickly scale capacity and performance while improving efficiency and reducing total cost of ownership. In addition, IT teams need to be able to easily manage hundreds of systems running in parallel.

Having the right data storage solution can address these challenges and fuel innovative research.

SOLUTION OVERVIEW

The NetApp® HPC solution features a complete line of high-performance, high-density storage systems. NetApp E-Series storage systems use a modular architecture with industry-leading price/performance that offers a true pay-as-you-grow solution to support storage requirements for multipetabyte datasets. The system is integrated with leading HPC file systems, including Lustre, IBM Spectrum Scale, BeeGFS, and others to handle the performance and reliability requirements of the world's largest laboratories.

AROUND THE CLOCK RELIABILITY

For most laboratories, downtime of any sort is intolerable. Many programs take months to complete. Downtime during that run can mean starting over. For other projects that require real-time data, such as weather forecasting, downtime can put lives at stake and cost millions of dollars in unnecessary preparations.

The NetApp HPC solution offers nonstop reliability with a fault-tolerant design that is proven to deliver greater than 99.9999% availability. With best-in-class redundancy, the NetApp HPC solution provides outstanding resilience, proven by more than 1 million systems deployed. Built-in Data Assurance features help ensure that your data is accurate with no drops, corruption, or missed bits—all the way from host to storage media.

With our extensive partner ecosystem to help us validate configurability, stability, interoperability, and reliability, you can be certain that your NetApp HPC solution is tried and proven to deliver the 24/7 availability your lab requires.

THE SPEED YOU NEED

Over the next decade, the HPC community will transition from petascale to exascale computing, performing a billion billion calculations per second. Having storage that keeps pace with the extreme workload needs of scientists is crucial.

The NetApp HPC solution gives you consistent, near-real-time access to research data like high-resolution telescope images. Performance is optimized to support any number of workloads simultaneously and is capable of up to 1 million random read IOPS and 13GB/sec sustained (maximum burst) write bandwidth per scalable building block. Optimized for both flash and spinning media, the NetApp HPC solution includes built-in technology that monitors workloads and automatically adjusts configurations to maximize performance.

EASY DEPLOYMENT AND SUPPORT

Managing hundreds of parallel systems at once requires a single management console that provides insight into each system.

The NetApp HPC solution makes enterprise storage easy. Unlike file systems that require multiple platforms and models to scale, the NetApp HPC solution is easy to install and support. The modular design enables your IT staff to nondisruptively add performance and capacity without complex deployments or migrations. On-the-fly replication lets you dynamically configure new systems for faster deployment. And scripts allow you to automate common tasks for easier management.

Proactive monitoring and support automate issue resolution and reduce management overhead. Worldwide support and 4-hour parts delivery help keep the research flowing. NetApp also offers secure support options for sensitive government sites.

LIMITLESS SCALABILITY

Scientists across a wide range of disciplines are creating multi-petabyte datasets that consist of tens of millions of files. As resolution increases, next-generation datasets are expected to be 6 to 10 times larger.

The modular design of the NetApp HPC solution offers a granular, building-block approach to growth that enables you to scale seamlessly from terabytes to petabytes by adding capacity in any increment—one or multiple drives at a time.

BUSINESS BENEFITS

Accelerate Performance

Deploy systems that deliver top performance in SPC-1 and SPC-2 benchmarks.

Simplify Operations

Integrate with your existing infrastructure and applications by using plug-ins, APIs, and orchestration tools.

Improve Reliability

Enjoy 99.9999%+ availability and industry-leading durability, based on nearly 1 million units shipped.

LOWER TOTAL COST OF OWNERSHIP

With datasets growing exponentially, storage costs can spiral out of control. With price/performance-optimized building blocks from NetApp, small to large configurations are cost efficient. In addition, NetApp HDDs and SSDs meet strict quality, performance, and interoperability requirements before acceptance. This extra scrutiny results in failure rates that are 4 times lower than commodity drives. Additionally, NetApp leverages the industry's best density per MB, resulting in lower power, cooling, and support costs. Finally, you enjoy the flexibility to support 100Gb IB, 100Gb NVMe-oF, 32GB FC, and 12Gb SAS connectivity. All of this adds up to significantly lower TCO.

MORE INFORMATION

To learn more about NetApp high-performance computing solutions for labs, visit netapp.com/hpc.

ABOUT NETAPP

NetApp is the data authority for hybrid cloud. We provide a full range of hybrid cloud data services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation. Together with our partners, we empower global organizations to unleash the full potential of their data to expand customer touchpoints, foster greater innovation and optimize their operations. For more information, visit www.netapp.com. #DataDriven