

# RED HAT STORAGE FOR HIGH PERFORMANCE COMPUTING

## THE CHALLENGE

High performance computing (HPC) has continued to gain popularity in recent years as enabling technologies and techniques have become more accessible, and data-intensive industries – such as financial services, energy, life sciences and more – have increased in competitiveness. Yet, organizations in these and other industries continue to face a number of challenges as they seek to employ HPC to gain competitive advantage.

Overcoming two challenges in particular are key to effectively delivering HPC. The first of these is achieving the sheer scale required by most HPC applications. With 100TB+ data sets common to HPC and multi-petabyte repositories a reality that many organizations face, the cost and complexity of building and running traditional NAS and SAN storage systems for HPC is often overwhelming.

However, even more important than raw scale for many HPC applications, is high throughput performance. If, as is the case with monolithic NAS and SAN storage, performance bottlenecks impede the ability of compute nodes to access stored data, the benefit of parallelization and the HPC approach is lost.

## THE SOLUTION

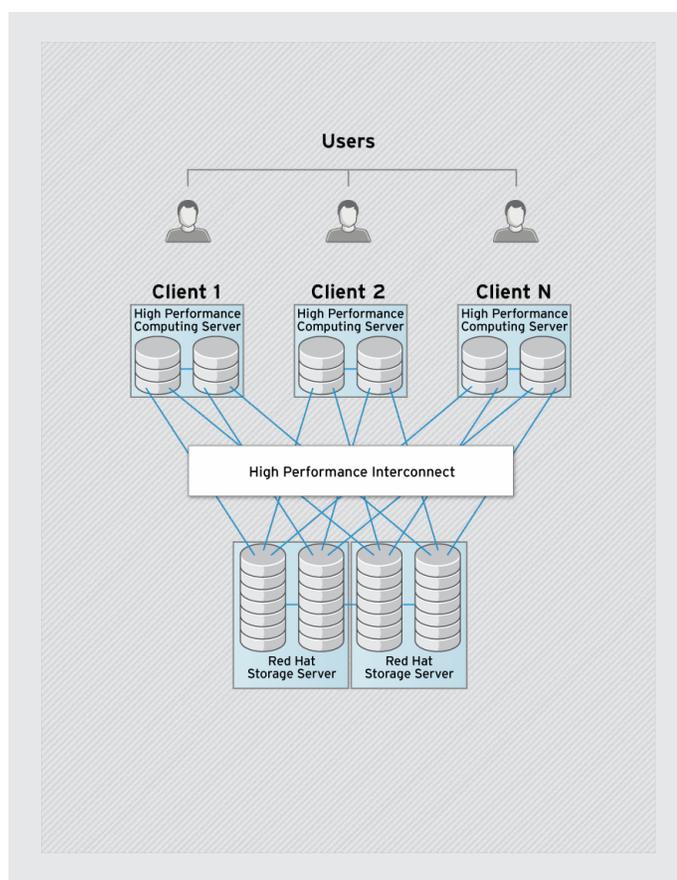
To meet the scalability and performance challenges of high performance computing, leading commercial HPC users are selecting Red Hat Storage Server in place of costly, proprietary storage arrays.

Red Hat Storage<sup>®</sup> Server family provides an open source, scale-out network-attached storage (NAS) and object storage software solution that is designed to work seamlessly with industry standard x86 servers. Built on the industry leading Red Hat Enterprise Linux<sup>®</sup> operating system, it provides freedom of choice to customers by allowing them to deploy cost-effective and highly available storage without compromising on scale or performance. Red Hat Storage Server can easily be deployed on-premise, in private clouds, in public cloud infrastructures, or in hybrid cloud environments and is optimized for high performance computing workloads demanding high bandwidth and throughput performance.

Key features of Red Hat Storage Server for scenarios involving HPC include:

- **Petabyte scale.** Red Hat Storage Server's fully distributed architecture and advanced file management algorithms allow it to efficiently support multi-petabyte repositories.

- **High performance with No bottlenecks.** Red Hat Storage Server delivers fast file access by algorithmically spreading files evenly throughout the system, without a centralized metadata server. Because compute nodes can access storage nodes directly, hot spots, choke points, and other I/O bottlenecks are eliminated, contention for data is reduced, and there is no single point of failure.
- **Infiniband support.** Red Hat Storage Server supports RDMA as a mount protocol for its native client, and Infiniband as a back-end interconnect for the storage pool, giving customers additional options for maximizing performance.
- **Elasticity.** Storage volumes are abstracted from hardware, allowing each to be managed independently. Storage can be added to or removed from the storage pool while data continues to be available, with no application interruption. Volumes can grow or shrink across machines and can be migrated within the system to rebalance capacity or add/remove systems on-the-fly, allowing HPC environments to scale seamlessly.
- **Compatibility with industry standards.** Due to native POSIX compatibility and support for the CIFS, NFS and HTTP protocols, Red Hat Storage Server is readily supported by existing applications with no code changes required.



## BENEFITS

By deploying Red Hat Storage Server in support of HPC use cases, organizations can readily achieve goals such as:

- **Reducing costs.** Deploying HPC storage systems on open, commodity hardware, rather than proprietary monolithic NAS and SAN systems, allows organizations to dramatically reduce capital costs while maintaining high levels of performance.
- **Eliminating complexity.** Built from the ground-up to deliver high levels of scalability, Red Hat Storage Server unifies disparate servers into a single, global namespace independent of the size and scale of the storage system, eliminating architectural complexity.
- **Simplifying operations.** Red Hat Storage Server can be deployed in minutes and scaled with a few clicks. Because Red Hat Storage Server automates the management of files and storage nodes, operational costs and complexity are dramatically simplified.
- **No vendor lock-in.** Red Hat Storage Server is based on the popular open source GlusterFS file system and runs on industry standard x86 hardware. As a result, Red Hat Storage Server offers users a trusted and supported storage system without the vendor lock-in of traditional NAS and SAN.

# DATA SHEET

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## ABOUT RED HAT

Red Hat was founded in 1993 and is headquartered in Raleigh, NC. Today, with more than 70 offices around the world, Red Hat is the largest publicly traded technology company fully committed to open source. That commitment has paid off over time, for us and our customers, proving the value of open source software and establishing a viable business model built around the open source way.

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