Western Digital.

SOLUTION BRIEF

Drive High Performance Computing with BeeGFS and OpenFlex™ Composable Infrastructure

BeeGFS®

Highlights

Breakthrough Economics: The integration of BeeGFS with OpenFlex offers a cost-effective solution that avoids vendor lock-in and can reduce power, cooling and licensing costs.

Sharable Performance: Extends the high performance of NVMe™ flash to shared storage, distributes workloads across multiple storage systems and gives your business a boost by providing high IOPs and bandwidth with consistent low I/O response times.

Simple Scalability: Enables capacity and performance to scale dynamically and independently, allowing the system to adapt to varying High Performance Computing (HPC) workloads.

Challenges

Increasing Demands: Exploding storage requirements are pushing storage infrastructures past the performance capabilities of HDD or SSD storage capabilities.

Management Difficulties: Inflexible legacy solutions can't keep pace with growing volumes of unstructured data and often result in silos of data that are difficult and costly to manage.

Skyrocketing Costs: Increasing amounts of data are driving up OPEX costs related to powering, cooling and managing multiple silos of data storage and public cloud options won't work for many businesses.

Solution

BeeGFS parallel cluster file system delivers strong performance for I/O-intensive workloads, provides linear performance scalability and sub-millisecond latency and is designed for easy installation and management.

Western Digital's OpenFlex Composable Infrastructure provides disaggregation of storage with the speed of NVMe SSDs to deliver high-density storage, performance and cost efficiency.

The combined solution will make your business thrive by accelerating performance, simplifying workflows and reducing costs. BeeGFS and OpenFlex work together to simplify the storage and management of mission-critical data for performance-hungry applications.

Addressing the Need for Increased Performance in HPC Environments

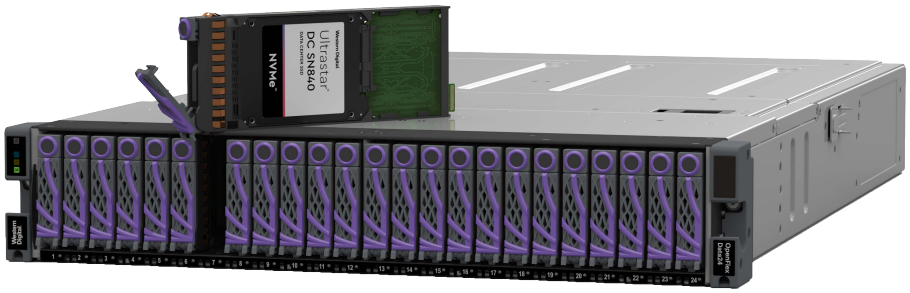
To gain a competitive advantage, many organizations are leveraging high performance computing (HPC) to handle data-intensive workloads that require consistently high levels of performance. Traditional disk-based storage simply can't meet these increasing performance needs, especially since these environments, workloads and datasets always seem to be increasing in size and importance year after year.

New-generation flash media, such as NVMe, are moving the bar by delivering single-digit µs (microseconds) latency. However, providing near-zero latency when sharing NVMe across the network is a challenge. This cannot be done with traditional controller-based architectures as those can only do low levels of IO processing before their bottleneck-design slows down, increases latency and eventually tops out.

Extend the performance of NVMe to Shared Storage with NVMe-oF™

NVMe-oF is a networked storage protocol that allows storage to be disaggregated from compute to make that storage widely available to multiple applications and servers. Exploiting NVMe device-level performance, NVMe-oF can deliver the data locality benefits of directly attached NVMe storage (low latency, high performance) while providing the agility, flexibility and cost savings of a common shared pool of storage capacity.

Exploiting NVMe device-level performance, NVMe-oF promises to deliver the lowest end-to-end latency from application to shared storage. From transaction processing and real-time analytics to machine learning and beyond, NVMe-oF can push your data strategy to the next level.



OpenFlex Data24 NVMe-oF Storage Enclosure

Western Digital Leads The Way with NVMe-oF Technology

Flash technology has revolutionized the performance of storage systems and Western Digital leads the way with NVMe-oF technology that propels flash storage to its full potential. Western Digital's OpenFlex Composable Infrastructure leverages NVMe-oF to enable HPC environments to thrive by extending the high performance of NVMe flash to shared storage. OpenFlex Composable Infrastructure provides the flexibility to meet varying requirements depending on data workload and performance requirements and is built to deliver screaming performance in HPC environments. With low latency and consistently high bandwidth, data is accelerated to the speed of flash and can be shared across hundreds of hosts. Storage infrastructures built on OpenFlex benefit from accelerated performance, improved responsiveness and increase the agility of your business.

BeeGFS Parallel File System Extends Performance Even Further

Western Digital is proud to partner with BeeGFS, an innovative high-performance parallel file system designed to provide the performance, scalability and flexibility required to run the most demanding HPC applications. BeeGFS solves bottleneck issues at the file system layer, is optimized for highly concurrent access to shared files and was specifically designed for data-intensive HPC workloads.

The BeeGFS parallel file system paired with Western Digital storage provides a highly scalable shared network file system with striped file contents. This allows users to overcome the performance limitations of single servers, single network interconnects or a limited number of storage devices. BeeGFS clients directly access shared storage and can communicate with multiple servers simultaneously, giving your applications truly parallel access to the shared data. In such a system, high throughput demands of large numbers of clients can easily be satisfied, but even a single client can benefit from the aggregated performance of all the servers in the system.

Not Only Increased Performance But Lower Costs Too

The combined solution of OpenFlex Composable Infrastructure and BeeGFS provides customers with the performance needed to accelerate their HPC applications and workloads by dramatically speeding up I/O operations. Faster I/O allows each server to handle more transactions, resulting in the CPU spending less time waiting for data. The increased performance provided by all-flash NVMe-oF storage enables higher workload volumes while using fewer CPU resources—resulting in a reduction of the number of servers needed in your data center. Shared storage also helps reduce the number of data storage silos and increases data storage efficiency. Server and storage resource consolidation means cutting capital and operational costs with fewer systems to power, cool, license and maintain.

Conclusion

Designed for the most demanding, data-intensive HPC applications and workloads, a combined solution from BeeGFS and Western Digital can dramatically change the economics of high-performance storage. Leveraging powerful NVMe technology, virtualization and cost-effective capacity, the solution delivers incredible performance, efficiency and reliability that can help give your business a competitive edge.

For more information on how BeeGFS high-performance parallel file system paired with Western Digital's OpenFlex Composable Infrastructure can turbo-charge your data storage infrastructure and improve business operations, visit westerndigital.com/platforms

Western Digital.

5601 Great Oaks Parkway
San Jose, CA 95119, USA
www.westerndigital.com