ANALYTICS FOR FINANCIAL MODELING
Fast Wall Clock Time for Better Trading

INDUSTRY
Financial Services

BENEFITS
Quantitative Analytics
High-Velocity Analytics

BUSINESS REQUIREMENT
Deliver best possible wall clock time for new latency sensitive simulation workloads

SOLUTION
WekaFS™

BUSINESS BENEFITS

- Delivers equivalent performance to local SSD drives
- Meets, or exceeds, wall clock time service level agreements (SLAs) to ensure best trading strategies
- Achieves > 65% storage cost savings by leveraging shared storage instead of individual drives across each node in the HPC cluster
- Provides significantly simplified storage infrastructure
- Integrates cloud tiering and cloud bursting for better economics and capacity on demand

High-frequency trading has undergone a revolution through the application of predictive financial models to trading strategies, and success is measured by fast execution based on scientific model results. Leading quantitative trading companies are constantly seeking out new strategies to gain better market insight and improve trading outcomes. The team members who work in quantitative trading have some of the best minds in math, computer science, and engineering. As academics from major institutions, they look for the most advanced technologies and techniques to develop a competitive edge. The constant evolution of new models presents a high level of unpredictability to the underlying infrastructure and requires a modern IT architecture that can handle the most demanding storage workloads — data-intensive and latency-sensitive applications.

THE CHALLENGE: MINIMIZING WALL CLOCK TIME FOR TRADES

Given the academic nature of quantitative trading, it is common to leverage the tools used in high-performance computing (HPC) simulations for financial modeling. Many financial trading institutions have enjoyed years of success with legacy HPC parallel file storage infrastructures such as those from IBM that were designed around large block sequential I/O. Today's trading workloads, however, require writing millions of tiny files out to persistent storage at a very high rate and performing near real-time analytics on the data.

POOR SHARED STORAGE PERFORMANCE TO HPC CLUSTERS

Legacy parallel file systems were developed and optimized decades earlier for spinning media and cannot easily leverage modern low-latency storage media using flash technology. HPC systems buckle under the small-file, latency-sensitive workloads, and wall clock times can increase by as much as 4x compared to local SSDs inside the high-performance computing cluster. The poor performance — and the associated increase in wall clock time to complete a market simulation — means that legacy HPC systems are not well suited for the new workloads common in financial services. As a workaround, many teams are electing to run their workloads on local SSD storage drives inside the HPC nodes to restore an acceptable trading window.

## CHALLENGING MANAGEMENT OF LOCAL STORAGE FLASH

Local SSD storage inside the individual HPC compute nodes can deliver great performance; however, over time, it can introduce new headaches due to the nature of the financial services workloads. Flash technology provides great random, small-file performance but unlike disk drives, it has limited endurance and is particularly vulnerable when a workload is write-intensive. As drives begin to fail, keeping the application environment productive becomes a daunting challenge. At extreme scale, replacing all the SSDs would be a prohibitively expensive proposition as all HPC

nodes would have to have local NVMe storage even if the application does not need that much physical space. In addition, as drives continue to fail, further application disruption is common and will eventually force a decision on total replacement of SSDs.

THE SOLUTION: WekaFS™ SOFTWARE ON COMMODITY SERVER INFRASTRUCTURE

Many organizations consider SAN-based solutions utilizing iSCSI for all the storage nodes; however, these solutions present associated challenges and performance is not guaranteed. To deal with the biggest, most complex problems, the only solution is WekaFS. It is the modern file system from WekaIO that is uniquely built to solve today's big problems, and it has broken many industry standard benchmark records. In fact, it has become the de facto storage standard for Quantitative and High Velocity Analytics use cases.

WekaFS is a fully parallel and distributed file system that has a clean sheet design that maximizes performance with high-performance Flash technology. Both data and metadata are distributed across the entire storage infrastructure to ensure massively parallel access to NVMe drives. With a

WekaFS Delivers Local Disk Performance to the HPC Cluster

single namespace that spans local storage and the cloud, WekaFS delivers performance that is 3x that of local file systems and 10x that of traditional NAS or SAN.
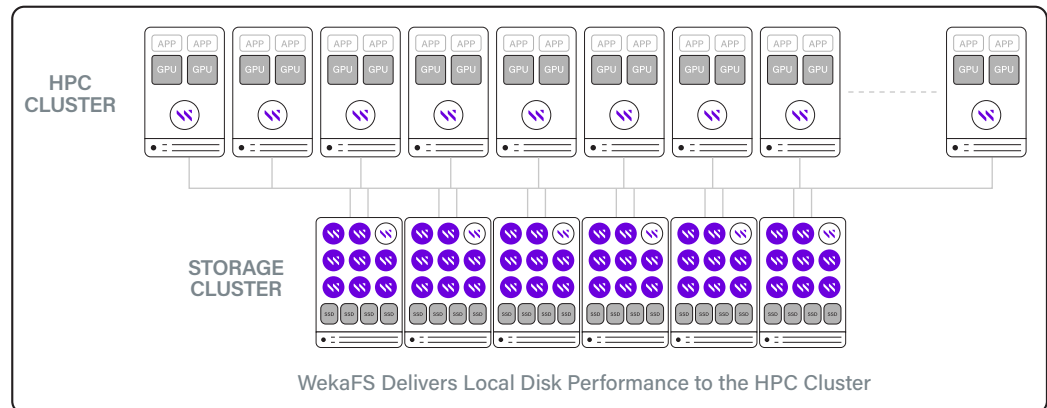
WekaFS is highly resilient and delivers the highest-bandwidth, lowest-latency performance to any InfiniBand or Ethernet-enabled GPU or CPU-based cluster. The POSIX-compliant file system has an innovative, highly optimized software stack that leverages modern architectures such as low-latency NVMe-oF and massively distributed metadata. Built for enterprise-grade HPC, WekaFS tightly integrates object storage for best economics at scale and supports features such as snapshots, cloud backup, and multiprotocol support, including NFS and SMB.

Financial Services customers who use WekaFS enjoy the benefits of full cloud integration and the ability to leverage public cloud compute resources, including automated tiering and cloud bursting. As an added bonus, the WekaFS solution significantly simplifies storage management and infrastructure. Many storage alternatives require complex performance tuning to achieve the performance characteristics required, but WekaFS is simple to manage out-of-the-box and requires no specialized tuning.

BUSINESS BENEFITS

Implementing WekaFS™ in your Financial Services environment:
- Delivers equivalent performance to local SSD drives
- Improves wall clock time to help ensure service level agreements (SLAs) are met or exceeded
- Delivers > 65% storage cost savings by leveraging shared storage across each node in the HPC cluster
- Dramatically simplifies infrastructure management with no HPC compute cluster downtime
- Enables leveraging of elastic public cloud compute resources for new application workload support

To find out more or to arrange for a free trial, go to https://www.weka.io/get-started or contact us at info@weka.io.

WEKA

910 E Hamilton Avenue, Suite 430, Campbell, CA 95008   T: 408.335.0085   E: info@weka.io   www.weka.io