The World's Fastest File System for Financial Services

Hitachi Content Software for File

SOLUTION BRIEF

A Modern File System for Finance
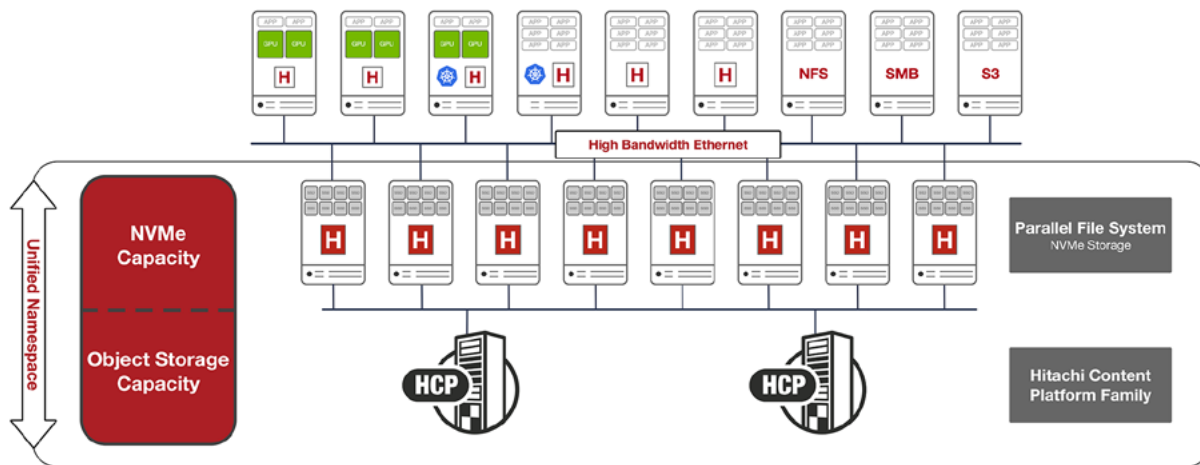
Speed. Agility. Storage. In financial services, the need has never been greater. A new breed of applications in technical computing, analytics, and deep learning have placed unprecedented demands on financial services for storage I/O, throughput, latency, and scalability. Which makes Hitachi Content Software for File's unique features and capabilities more important than ever to your organization.

Customer Case Studies

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PROBLEM: A major quantitative trader's automated proprietary trading solution, from shared parallel file system, causing a 75% drop in performance

SOLUTION: Hitachi Content Software for File improved overall performance by three times over DAS:
• Performance exceeded local NVMe drives
• Eliminated need to copy data to the application servers
• 65% saving on storage costs as NVMe drives never burned out

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PROBLEM: A major New York Stock Exchange institution providing an equity trading platform found that:
• Cost of infrastructure was prohibitive
• Scaling was extremely challenging
• They lacked a robust DR strategy because of the overwhelming costs involved

SOLUTION: With Hitachi Content Software for File, the institution has seen:
• Seven times the performance, allowing reduction of compute resources to one-seventh of expected purchase
• Modern solution allows for easy recovery in the case of a major disaster
• Massive cost savings in compute and shared storage

Hitachi Content Software for File: High Velocity, High Performance

Hitachi Content Software for File's performance and scalability deliver high-velocity analytics that can differentiate your financial services and give you a competitive advantage. Hitachi Content Software for File gives you:

NVIDIA® Magnum IO GPUDirect® Storage Solves the I/O Bottleneck

- GPUs require high volumes of data in high-performance fashion; to ensure storage is not the bottleneck, engineers traditionally placed data on the GPU servers' local storage, which is expensive.

- Hitachi Content Platform for File incorporates NVIDIA Magnum IO technology, whose key element is GPUDirect Storage.

- Magnum IO GPUDirect Storage removes many bottlenecks that slow down IO between the persistent storage and the GPU processor, by eliminating the need for CPU involvement in the communication loop.

- Magnum IO GPUDirect Storage delivers faster data throughput on multi-server, multi-GPU computing, providing valuable performance improvements as customers scale beyond a single system to larger configurations.
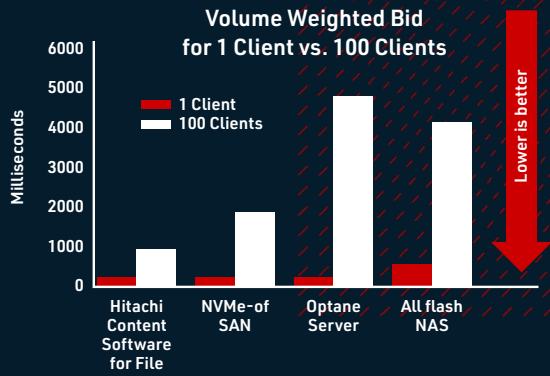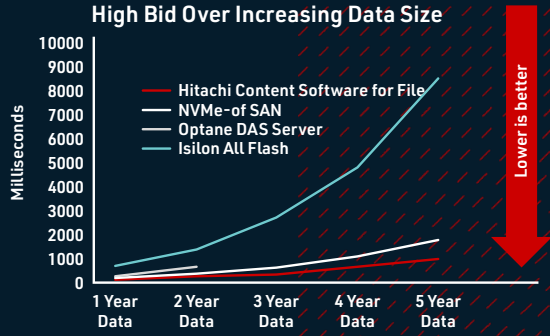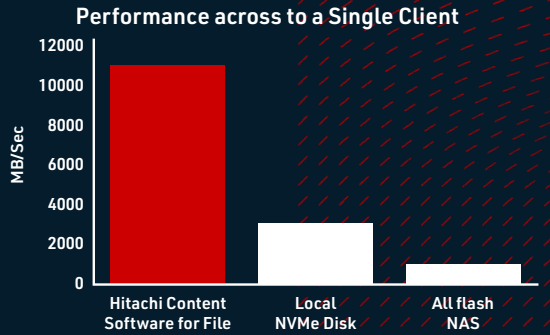
Highest performance for algorithmic trading, portfolio analysis, and risk management

- Access a massive data lake for better real-time market data analysis without any storage performance bottlenecks.

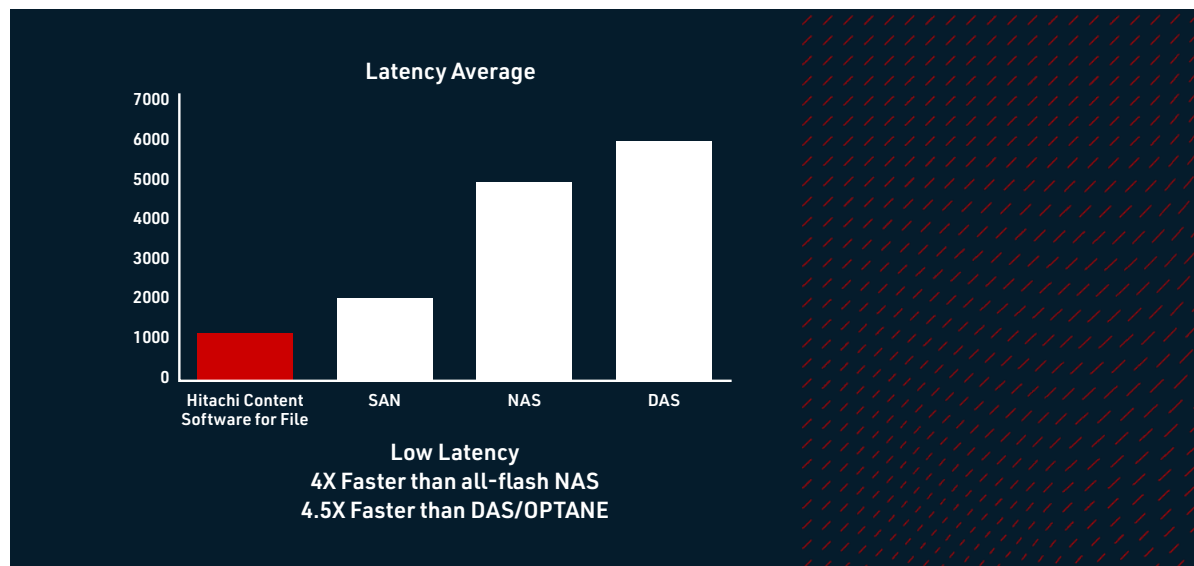- Validated with Kx Systems software and accelerates kdb+.

- Record-breaking software-based architecture unleashes the high performance and low latency of native NVMe support for your algorithmic trading and back-testing.

- Bottom line: personalized investment guidance, improved credit and risk assessments, faster actuarial analysis, and accurate fraud detection.

Security, data protection, and disaster resiliency

- Keeps your most sensitive information secure with both in-flight and at-rest data encryption.

- Fully integrated with key management systems so your data that is migrated to cloud storage is fully protected.

- Uses a patented distributed data protection scheme that delivers the resiliency of advanced erasure coding with higher performance and less overhead than replication, RAID, or other erasure coding schemes.

- Snapshot-to-object feature leverages Hitachi integrated object storage to ensure business continuity, disaster resiliency, and data availability regardless of location.

Record-Breaking Performance on STACM3

Performance across to a Single Client

MB/Sec

12000
10000
8000
6000
4000
2000
0

Hitachi Content Software for File | Local NVMe Disk | All flash NAS

High Bid Over Increasing Data Size

Milliseconds

10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0

— Hitachi Content Software for File
— NVMe-of SAN
— Optane DAS Server
— Isilon All Flash

1 Year Data | 2 Year Data | 3 Year Data | 4 Year Data | 5 Year Data

Lower is better

Volume Weighted Bid for 1 Client vs. 100 Clients

Milliseconds

6000
5000
4000
3000
2000
1000
0

■ 1 Client
□ 100 Clients

Hitachi Content Software for File | NVMe-of SAN | Optane Server | All flash NAS

Lower is better

Latency is the Enemy of Trading

Latency Average

7000	
6000	
5000	
4000	
3000	
2000	
1000	
0	

Hitachi Content Software for File   SAN   NAS   DAS

**Low Latency
4X Faster than all-flash NAS
4.5X Faster than DAS/OPTANE**

Hitachi Content Software for File is the world's fastest shared parallel file system, giving you unmatched, leading-edge performance at any scale, yet it's simple to use. Critically, Hitachi Content Software for File is fully integrated with Hitachi Vantara cloud object storage, so you fully benefit from the cost and scale of the cloud—without the complexities and compromises.

Hitachi Content Software for File meets all your storage challenges, delivering 10 times the performance of legacy network attached storage systems and three times the performance of local server storage. Built to run on any standard server hardware, whether on-premises, in the cloud, or shared across both, Hitachi Content Software for File gives you control of hardware choices and saves you money.

Customer Case Studies

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PROBLEM: A capital markets trading firm ran into issues when serving data to trader models:
• Data sets exceeding 600TB
• All-flash NAS was underperforming

SOLUTION: Hitachi Content Software for File:
• 10x performance increase over NAS
• Enabled private cloud backup
• Better cost modeling through object storage

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PROBLEM: A major financial institution encountered issues running their kbd+ modeling:
• Costs were exorbitant
• Sharing was encumbered by file coping requirements
• Single user design

SOLUTION: With Hitachi Content Software for File:
• Multi-server scaling as needed
• Reduced cost of equipment
• Wider service reach

RESULT: Increased speed and access with reduced costs.

Accelerate SAS® Analytics Workloads

SAS analytics software is one of the most widely deployed business intelligence tools. But while SAS Grid Manager and SAS Viya® are architected to meet the demands of modern business analytics and optimize modern multi-core CPUs, their performance and scale are limited by access to volumes of data and storage I/O responsiveness. Even today's leading on-premises and cloud storage solutions cannot keep up with the capabilities of modern CPUs and servers. As a result, SAS Grid Manager and SAS Viya application servers can remain vastly underused as they wait for.

Hitachi Content Software for File accelerates SAS Foundation, SAS Grid Manager, and SAS Viya workloads—job completion times and data pipelines—by delivering ultralow latency with massive ingest bandwidths, enabling predictive and cognitive analytics for these heavy random and sequential read/write mixed workloads. That means you can:

- **Accelerate Time to Market:** Business outcomes, time to market, long running jobs and data loads for SAS analytics at scale

- **Optimize Your Investment:** Run 10X more workloads with the same SAS licensing; improve TCO, eliminating racks of server infrastructure; and Maximize storage costs with a hybrid storage data lake

- **Simplify Management:** No code changes, continue to use SAS Enterprise Guide/Data Miner

Plus, Hitachi Content Software for File enables agile responsiveness. Spin up and down SAS servers in the public cloud to meet your workload requirements.

Up to

66%

improvement in database run time

Using flash technology, the Hitachi Content Software for File management interface makes managing petabytes of storage a breeze, beating local disk storage (DAS), NVMe-over-fabrics SAN, and all-flash NAS in STAC M3 benchmarks.

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Records Set in STAC-M3 Testing

Hitachi Content Software for File also helps you reduce IT costs by making the most of your capital equipment investments. You can use any off-the-shelf SSD or standard Ethernet or InfiniBand component, which means you're not locked in to any vendor—and its high margins. And support is included with your subscription, so it's worry free.

Hitachi Content Software for File Value

World's Fastest Shared File System

Validated on SPEC SFS 2014, IO-500 and STAC M3 benchmarks

Platform Agnostic

Supports bare-metal (commodity hardware), containerized, virtual, and cloud environments

Flexible Deployment Models

Converged, dedicated storage server, or native in the cloud

Multi-Protocol

Flexible application storage access: POSIX, NFS, SMB and NVIDIA® GPUDirect® storage

Mixed Workloads

Supports small and large files simultaneously, with both mixed random and sequential I/O patterns

Linear Performance Scaling

Application-level 4K I/O, sub-250μ second latency, unlimited random OPS

Automated Tiering

Expand the namespace from fast flash to hard disk storage via on-premises or cloud object storage

Distributed Storage

Fully distributed data and metadata to ensure that there are no hotspots in the storage cluster

Data Security

Distributed resilience that eliminates the bottlenecks of traditional data protection

EIGHTY HOURS

Validate

Train

Transform

20X Improvement in Performance

FOUR HOURS

Before
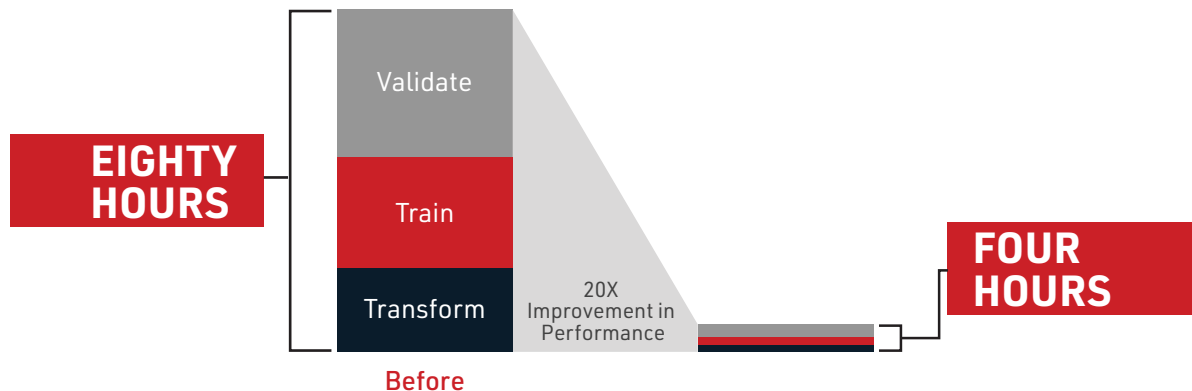
Distributed Accelerated Computing Use Cases

CPUs, GPUs, FPGAs, Accelerators

AI/ML/DL

Autonomous Vehicles & ADAS • Algorithmic/ HFT Trading & Financial Analytics • Bioimaging & Healthcare • Predictive Analytics • Fraud & Security • Natural Language Processing & Recommendation Engines

HIGH-PERFORMANCE COMPUTING (HPC)

Scientific Use Cases • Simulations: Fluid & Monte Carlo • Life Sciences—Genomics, Biotech/Pharma • Electronic Design Automation (EDA) • Oil & Gas: Reservoir Simulation

HIGH-PERFORMANCE DATA ANALYTICS (HPDA)

Automated Trading (ML) (High-frequency Trading Algorithmic Trading) • Fraud Detection & Prevention (Fraud Analytics • Authentication • Cybersecurity) • Risk Management (Risk Analytics • Strategic, Financial, Operational, and Compliance)

AGILE, CLOUD-BASED, AUTOMATED TIERING AND CLOUD BURSTING

Adapt to changing business needs • Unified namespace for multiple workloads eliminates data silos and enhances sharing, collaboration, and productivity • Integrated tiering for seamless, policy-based background migration of cold data to more cost-effective S3 cloud storage for long-term retention • Can be flexibly configured to be on-premises or as a hybrid cloud infrastructure • Cloud bursting provides processing and storage resources to accommodate your most dynamic business demands and workload spikes

Take the Next Step

To get more insights on this solution, download our datasheet.

Discover all that Hitachi Content Software for File has to offer you or contact your Hitachi Vantara representative today.

We Are Hitachi Vantara

We guide our customers from what's now to what's next by solving their digital challenges. Working alongside each customer, we apply our unmatched industrial and digital capabilities to their data and applications to benefit both business and society.

Hitachi Vantara