Fast moving companies with innovative technologies, are shaking up the financial services industry. These advancements are becoming creative and disruptive forces, driving both new business models and greater overall profitability in the financial services industry. Banks and other companies in the financial sector are leading the way in terms of using HPC and low-latency systems. These systems are used in a variety of ways including trading, financial modeling and analysis, black-box trading, algorithmic processing, complex financial risk analysis, order routing and implementation of more reliable systems in general.

Lenovo HPC, powered by Intel® Xeon® Processors, delivers the high-performance and ultra-low latency required to power financial industry innovation, reducing IT complexity and operational costs, and helping to meet regulatory requirements.

Technology and innovation driving profitability

The financial services sector has pioneered the use of HPC and ultra-low latency for high-frequency algorithmic trading, complex risk evaluations, fraud detection and overall improvements in system security and uptime. The immediate reasons include the ability of HPC systems to react to market conditions sooner and perform deeper
market analysis compared to traditional IT. However, the benefits of HPC systems go further than reduced latency. Lenovo HPC systems, for example, offer increased reliability to ensure your systems and applications maintain the highest levels of availability, improving customer service and market response. Combined with reduced complexity and operational costs, all of these benefits help you maximize profitability.

**Added security through HPC and blockchain**

For financial applications, perimeter security alone isn’t enough to protect against malware and data breaches. Many have turned to advanced security analytics to monitor traffic and analyze user data to spot activity that can accurately predict potential IT security attacks at the moment they occur. Since speed of detection, protection, and eradication of malware and attackers is paramount, HPC systems offer ideal infrastructure due to their ability to deeply process large amounts of data in real time, for faster anomaly detection.

With high-performance, responsive technology that can scale-out massively and offer you superior levels of security, partnering with Lenovo for HPC means adopting innovation faster, at lower all-round risk. Lenovo designed their HPC systems with security features built-in through a bottom-up approach, driving reduced risk with end-to-end security. Compared with traditional IT solutions, Lenovo HPC systems greatly simplify your infrastructure for even greater security.

Lenovo HPC storage solutions support your data and analytics needs with the same built-in security. This allows you to keep your data in-house while still experiencing the economic benefits. Combined with security advances such as blockchain, Lenovo HPC systems offer a wider range of security controls for your customers and your business. Lenovo has adopted blockchain technology itself, in product development activities and is working to apply the solution to a wide range of work processes, such as payment systems.

**Customer intelligence restoring growth and profitability**

Growing your business and profitability requires you to accelerate innovation. Lenovo HPC systems help you achieve this by enabling you to store and process more data for deeper analysis. This includes market and customer data, where the additional HPC workload processing capability powers AI to better predict and meet customer needs. For example, financial products can be individually tailored to customers’ credit risk to maximize profitability.

Through market-leading storage solutions and exceptional compute performance, Lenovo HPC brings disparate data sets and open-source applications together for more insightful and collaborative workflows. Additionally, Lenovo HPC powers AI and machine learning through scalability, helping you move faster than your competition. As a result, applications with large data sets run at their highest speed to help you identify market patterns sooner and react without delay.

**Modernizing IT infrastructures and systems**

Lenovo can provide complete infrastructure delivery at the rack level with a single point of support for compute, storage, and interconnection fabric to simplify your IT and reduce staff overhead. With the added support for varied workloads and their demands, Lenovo HPC will help modernize your IT and enable your business to deliver new services as needed.

**Return on investment is quicker with HPC**

Recent research by Hyperion has shown that, on average, for each $1 invested in HPC in financial services, $834 revenue is generated and $61 of profit. ROI with Lenovo HPC systems can be achieved through greater innovation, process optimization, and the creation of new solutions and business opportunities.
These include improved fraud detection, enhanced customer service through increased data security, faster results from research and development efforts to drive new financial product introductions, and the ability to integrate growing volumes of data, sooner to offer new services to end-users.

**Lenovo HPC benefits and differentiators**

Lenovo is the leading vendor on the TOP500 list of the world’s fastest supercomputers and its HPC solutions offer to FSI companies accelerated time to market with low latency infrastructure. These include the fastest Intel® Xeon® Scalable Processors with the highest clock speed and lowest jitter for high determinism, and technology that can scale-out massively while maintaining enterprise-class security standards to minimize risk. Innovative communication fabric for mission critical performance and reliability continues to drive big data and customer analytics, leading to new solutions in the financial industry.

Lenovo HPC solutions for financial services are designed with a building-block approach to simplify management and enable customized expandability. This strategy provides a high-performance data center with simplification and standardization. To achieve this, Lenovo has partnered with other leaders in the IT industry. For example, the converged infrastructure of the Lenovo HPC portfolio combines advanced data storage clusters with the maximum flexibility and workload processing of Intel® Select Solutions driven by Intel® Xeon® Scalable Processors. Additionally, Lenovo partners with SUSE to provide a fully supported set of the most in-demand tools and components used in HPC environments.

**Case studies in Lenovo success**

Financial companies such as Pacific Credit Card Center, Bank of Communications, are using Lenovo systems to scale their operations to levels needed to stay ahead of competition. The bank turned to Lenovo Converged HX3500 appliances powered by Intel® Xeon® and Nutanix Enterprise Cloud Platform software, to support its vital testing and development environments, gaining the scalability and agility it needs to stay ahead in a competitive consumer credit market.

Beyond big data and analytics, HPC systems are helping companies to process payments sooner, issue cards more quickly, and respond to a growing number of customers’ financial needs. Other examples include:

- **SAS:** Answering big questions with powerful big data analytics storage. To help its customers turn reams of big data into valuable insight, SAS relies on a rock-solid infrastructure that includes Lenovo ThinkSystem servers to support its operational systems, and cutting-edge research and development environments.

- **Redline Trading:** Firms rely on ultra-low latency and predictable performance for profitable trading with Redline solutions on Lenovo System x3750 M4 servers, based on the Intel® Xeon® processor E5-4600 v2 family.

- **Fixnetix:** Using a Lenovo HPC-based infrastructure, including robust System x3650 M4 servers, Fixnetix can offer its clients the ultra-high performance, reliability and efficiency they need to achieve high returns. In addition, Lenovo service, scalability and commitment give Fixnetix an edge in the competitive marketplace.

- **Fluent Trade Technology:** By partnering with Lenovo, Fluent has improved operational efficiency and boosted performance for companies involved in high-frequency foreign exchange trading. Pairing Lenovo x3750 M4 servers with Intel® Xeon® E5-4600 v2 product family processors and Fluent Trade Technologies software delivers low latency and increased flexibility in a dense 2U design. The solution has helped clients achieve single-digit microsecond latency for high-speed trading; reduce power, cooling and real-estate costs; and speed deployment of emerging technologies.

Additionally, the Lenovo ThinkSystem SR950 with Intel® Optane™ drives has set 9 new performance world records with the “big memory” Shasta suite of the STAC-M3 benchmark. The STAC-M3 Benchmark suite is the industry standard for testing solutions that enable high-speed analytics on time series data, such as tick-by-tick market data, also known as tick database stacks.
The Lenovo solutions

With Lenovo HPC, there’s no barrier to interacting with sophisticated, award-winning computing capabilities. Instead, there’s a proven full-stack solution, with a straightforward user interface, that is uniquely designed to support your applications and research. Coupled with access to experts for your particular research challenges and a single point of support; you’re simply able to analyze faster, from a deeper store of data, and make more insightful decisions.

The Lenovo ThinkSystem range of servers provide a flexible, agile foundation for your HPC cluster. These include:

• The ThinkSystem SD530 for when density, flexibility, and scalability matter most. With Lenovo’s innovative Shared-IO capability, this system allows for latency gains while reducing overall interconnect costs.

• The ThinkSystem SR630 and SR650, advanced industry standard 1U and 2U servers, with innovative features for energy efficiency and quiet operation.

• The Lenovo ThinkSystem SR950, suitable for mission-critical applications that need the most processing power possible in a single server. The powerful, modular 4U ThinkSystem SR950 can expand from two to as many as eight Intel® Xeon® Scalable Family processors.

• Low-latency network solutions from Lenovo, Intel® Omni-Path® Architecture, and InfiniBand fabrics.

• Lenovo LeSI (Lenovo Scalable Infrastructure) for designing, integrating and delivering complex data center solutions.

• Lenovo LiCO (Intelligent Computing Orchestrator) software stack to simplify AI and ML-based deployments in an enterprise environment.

With high-performance and highly responsive technology that can scale-out massively, partnering with Lenovo for HPC means adopting innovation faster for greater security and business growth, faster ROI, and lower all-round risk.

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