



Securing the trading platform of a leading stock exchange

A foolproof approach to trading with Aujas CodeSign

SUCCESS STORY | CODESIGN

About **client**

The client is one of the world's largest stock exchanges and runs one of the largest trading platforms. For the last five years, it has been number one globally in terms of derivatives contracts traded. According to the World Federation of Exchanges, it is one of the top three globally in the equity segment by volume of trades. The client has over 200 stockbrokers registered and 2000+ companies listed on the exchange. Recently, it set a world record regarding the number of transactions in a single day.

Since its inception, the market capitalization for

companies listed on this stock exchange has increased 100 times to a staggering USD\$5 trillion. The business leadership invests in advanced technology to operate its systems and maintain its state-of-the-art infrastructure to meet its dynamic requirements and pursue a high-performance IT strategy. They have built a highly versatile trading hub with a world-leading multi-asset class exchange and have always been pioneers in investing in tech ahead of time. For example, it introduced APIs two decades ago when no one thought about it.

A foolproof approach **to trading**

The client's IT strategy supports a complex, mission-critical trading ecosystem, requiring a robust infrastructure to stay at the cutting edge of technology. To achieve this, the client sought to enhance its

software applications' availability, security, and integrity, particularly those used by brokers and internal systems. Unique business and regulatory demands drive this approach:

Uninterrupted service



With zero tolerance for downtime during trading hours, the client-built core trading systems on fault-tolerant architectures, ensuring operations continue seamlessly during market hours and beyond.

Beyond standard security



Software security is designed to withstand primary data center failures, with performance and security intact. A SaaS-based trading platform enables continuity, while regulations require hosting it in other major exchanges' data centers as a failsafe.

Trusted software distribution



Rigorous security layers ensure that software distributed to brokers remains genuine and tamper-free, maintaining trust at every level of the technology stack

Comprehensive software validation



All internal systems—including self-developed, commercial, and open-source software—undergo rigorous validation to meet high security and performance standards.

These requirements reflect the client's growing operational scale, the increasing complexity of

cyber threats, and the critical need to uphold trust, transparency, and data integrity in the financial market.

Business **needs**

As one of the largest and most trusted stock exchanges, the client operates under stringent demands for resilience, scalability, availability, and ultra-low latency—all within a highly regulated environment. To

maintain a secure technology infrastructure that meets these exacting standards, the client partnered with a trusted provider to implement robust code security principles and best practices.

Business needs



Dynamic code validation

The client has primed its software code infra for sudden market shifts. It monitors its system loads in real-time and requires dynamic code validation to support the process.



Balancing security with operational efficiency

Code signing implementation is needed to enhance security without significantly impacting the speed and efficiency of software deployment. The IT Team needed to find the right tool to automate the code-signing process to continue serving the internal systems and the external broker and trading community.



Near zero software latency

The systems must process millions of transactions per second. The code is fine-tuned continuously for rapid response, with some components clocking nanosecond latencies. This requires an advanced codesigning process.



Large and diverse software ecosystem

The client's core trading application alone consists of 45 million lines of code across multiple market segments. The client uses a mix of self-developed, commercial, and open-source software, each requiring different validation approaches.

Business **solution**

Aujas Cybersecurity implemented a comprehensive code-signing solution with the following key features:

Private key security

HSM integration ensures private keys are securely stored and accessible only within the solution.

Certificate management

Centralized inventory for easy cross-platform certificate management.

Extensive file type support

Broad support for Windows and Linux applications across the organization.

End-to-end validation

Ensured tamper-proof software security from development through deployment across the entire supply chain.

Third-party certificate-based signing

Implemented a system where an independent third party signs the code, enhancing trust and verifiability.

Role-Based access and policy enforcement

Controls each signing action, aligning with strict code-signing policies.

Seamless Dev/DevOps integration

CLI-based integration to streamline code signing within existing workflows.

Automated signing process

Streamlined the code signing procedure to minimize development and deployment pipeline friction.

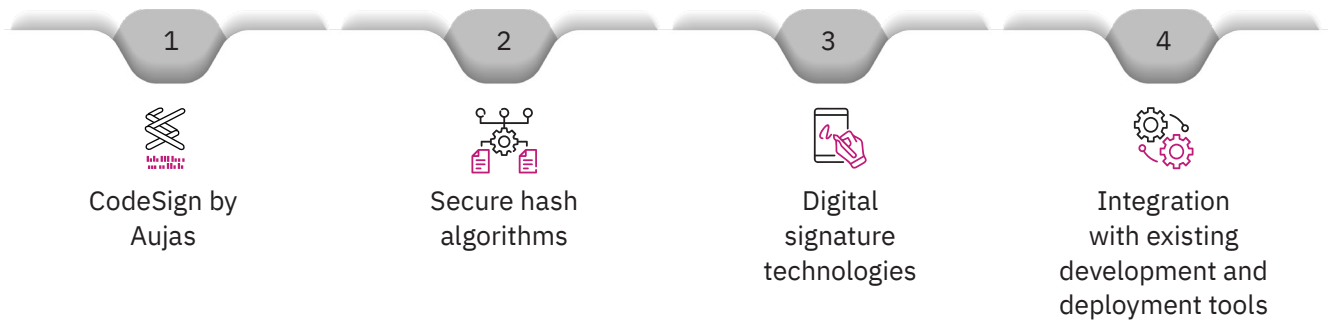
Internal software validation

Extended code-signing to all internal applications, including proprietary, commercial, and open-source software.



Technology **stack**

The technology stack included:



Project differentiator

The code signing implementation stood out in several ways, demonstrating the exchange's commitment to security and willingness to go beyond standard practices. These differentiating factors set the client

apart in the financial services sector and positioned it as a leader in proactive security measures. The unique aspects of this project include:

Comprehensive scope

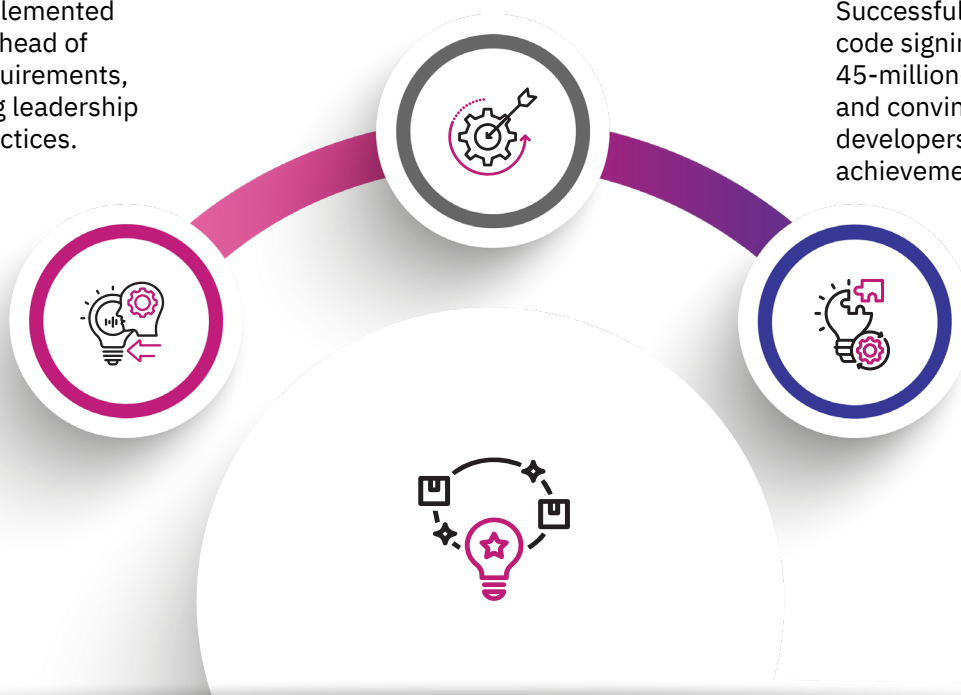
The project aimed to cover not just externally distributed software but all software running within the client's systems.

Proactive approach

The client implemented this solution ahead of regulatory requirements, demonstrating leadership in security practices.

Scale of implementation

Successfully implementing code signing across a 45-million-line codebase and convincing 1200+ developers is a significant achievement.



Business **impact**

Implementing code signing at the stock exchange yielded significant benefits beyond technical improvements. This initiative had far-reaching implications for the client's operations, reputation, and strategic positioning in the market. The client mitigated potential risks by enhancing trust and security and strengthening its foundation for future growth and innovation. The business impact of this project can be observed across various dimensions:

Proactive modernization

With code signing in place, the client's technology team continuously modernizes the software portfolio, staying ahead of emerging threats and requirements.

80% Reduction in supply chain attack risk

Validating all software in operation has significantly reduced the client's exposure to supply chain attacks and malicious code.

Securing 45 million lines of code

Code signing assures brokers and regulators of the software's authenticity and integrity, reinforcing the client's commitment to trust, transparency, and data integrity.

Future-proofing for regulatory requirements

By proactively adopting advanced security measures, the client is well-prepared for evolving regulatory standards.

75% Increase in DevOps efficiency

Automating code signing has streamlined DevOps workflows, boosting efficiency by 75% and minimizing risks associated with manual intervention.





Conclusion

Technology leaders often focus on core infrastructure needs—reliability, availability, scalability, and security—while navigating complex industry-specific demands. Our client exemplifies this balance, using advanced technology to meet rigorous regulatory standards and investor expectations.

Implementing code signing marked a pivotal advancement in the security and integrity of the client's software ecosystem. By ensuring all software—both internally used and externally distributed—is verifiable, the client significantly reduced risks of tampering and malicious code.

This project strengthened the client's position in the financial market and underscored Aujas Cybersecurity's commitment to the highest standards of security and trust. Despite the scale and complexity of this implementation, Aujas' expertise helped deliver a seamless solution, positioning us as a leader in advanced security practices within the stock exchange sector.

About **Aujas Cybersecurity**

Aujas Cybersecurity empowers clients with enhanced security resilience by minimizing the potential for attacks, threats, and risks. We specialize in architecture risk analysis, comprehensive threat modeling, rigorous penetration testing, and secure coding guidelines. By partnering with us, you can strengthen your security defenses and maintain a robust security posture.

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