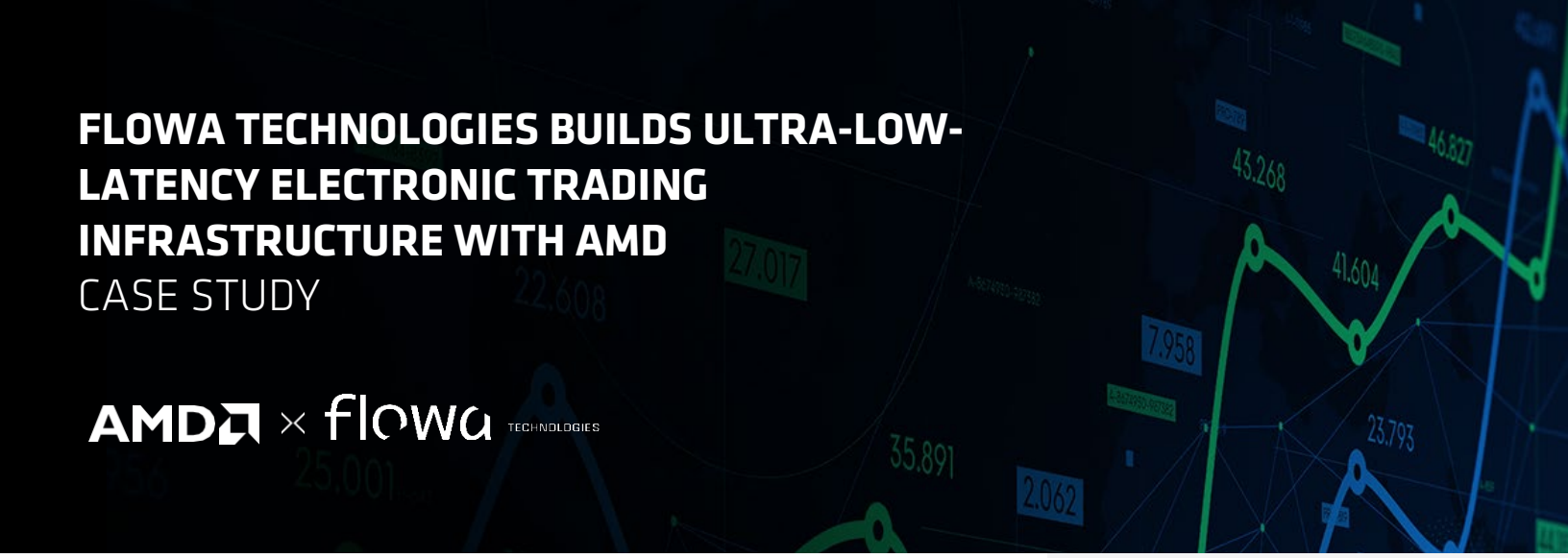
FLOWA TECHNOLOGIES BUILDS ULTRA-LOW-LATENCY ELECTRONIC TRADING INFRASTRUCTURE WITH AMD

CASE STUDY

AMD × flowa TECHNOLOGIES



Founded 15 years ago and headquartered in Rio de Janeiro, Flowa Technologies provides end-to-end electronic trading solutions for both buy-side and sell-side institutions. The company delivers multi-broker trading platforms, execution and order management systems, and advanced algorithmic trading capabilities accessible through APIs.

Today, the company's trading platform supports more than 300 institutional clients with nearly all brokers operating in Brazil, which means approximately 10 percent of the country's trades pass through its infrastructure.

"We provide all the products and services for electronic trading to help traders execute their orders on the exchange in Brazil," said Eduardo Nicodemos, chief technology officer at Flowa Technologies. "Almost 100 percent of local brokers operate through our infrastructure."

CHALLENGE

In latency-sensitive electronic markets, market data ingest and order reaction times directly determine how quickly trading strategies can respond to market events. Flowa's FPGA team focuses on workloads requiring deterministic behavior and extremely small latency budgets, particularly high-volume futures and derivatives instruments. In Brazil, heavily traded contracts, such as mini-index and mini dollar futures, generate millions of messages per second and are the basis for latency-sensitive trading strategies that operate large volumes of financial data.

As these trading strategies in futures and derivatives increasingly depend on deterministic, ultra-low-latency market data handling, Flowa identified practical limits in software-only architectures. "There is only so much performance you can squeeze when you are on a purely software solution," said Nilson Vaz Eduardo, head of FPGA development at Flowa.

In benchmark comparisons, Flowa observed that its software-based market data decoding pipeline introduced latency in the tens of microseconds, while FPGA-based processing reduced that figure dramatically.

However, achieving ultra-low latency was only part of the challenge. The company also required deterministic performance under peak market traffic, precise timestamping for round-trip latency measurement, and the ability to scale as the number of tradable instruments continued to expand.

Flowa's previous generation FPGA implementation allowed processing of approximately 150 latency-critical instruments entirely within the FPGA fabric. Beyond that threshold, scaling became constrained without a more advanced

INDUSTRY

FinTech

AT A GLANCE

- AMD Alveo™ V80 accelerator card enables ultra-low-latency data processing for electronic trading.
- FPGA-based architecture decodes and distributes data in hardware, reducing latency to nanoseconds.
- Hardware delivers deterministic performance and visibility across high-volume trading networks.
- Scalable platform supports Brazil's B3 markets and enables financial institutions to deploy fast trading systems.

CHALLENGES

Flowa needed to process massive real-time market data while supporting latency-sensitive trading and deterministic performance at peak traffic, as software-only systems reached their limits.

SOLUTION

Flowa chose AMD Alveo™ V80 accelerator cards to build a next-generation FPGA-based trading infrastructure for Brazilian markets.

RESULTS

AMD FPGAs enable Flowa to deliver ultra-low-latency market data processing with precise timing, real-time monitoring and scalable infrastructure for financial institutions.

AMD TECHNOLOGY AT A GLANCE

AMD Alveo™ V80 card

memory architecture. In addition, reliance on exchange-provided timing information was insufficient for performance assessment and internal tuning. Flowa required a highly reliable hardware-level monitoring system capable of timestamping every packet entering and leaving its infrastructure.

"Because the Brazilian market is still maturing when compared to more consolidated markets, such as the U.S., we have fairly limited vendors here that provide hardware-accelerated solutions," said Eduardo. As a result, Flowa needed an architecture it could develop and maintain internally, aligned with the protocols and microstructure of Brazilian markets and capable of evolving as exchange methodologies and customer expectations change.

SOLUTION

Flowa Technologies deployed AMD Alveo™ V80 accelerator cards to power its next-generation, ultra-low-latency market data and trading systems. By leveraging AMD FPGA technology, Flowa can process market data and monitor trading networks in real time. This enables financial institutions to execute trades faster in highly competitive futures and derivatives markets.

"Because Flowa has always been in the forefront of technology for the Brazilian market, we decided to migrate to the latest generation of AMD FPGA-based solutions by purchasing AMD Alveo™ V80 accelerator cards, which we deployed into our infrastructure. AMD helped us choose the right devices and port our solutions to the cards," said Francisco Gurgel, chief operating officer at Flowa.

The deployed infrastructure supports fully FPGA-based market data handling for Brazil's B3 markets, including equities, derivatives, and futures, along with hardware timestamping-based monitoring for packet-level visibility across Flowa's trading network. Two workloads are operating on the AMD Alveo V80 platform, including an internal monitoring system and a production market data solution supporting ultra-low-latency algorithmic trading services for local and global market participants trading in Brazil.

"For the market data system, we designed a hybrid architecture in which the most latency-sensitive instruments are processed entirely within the FPGA fabric to ensure maximum determinism and the lowest latency," said Gurgel. Additional instruments are handled through FPGA logic combined with external memory, removing previous practical scalability constraints. This hierarchical approach supports runtime configurability through a simple set of APIs, allowing customers to select which instruments have the strictest latency requirements.

The platform also integrates a hardware-based monitoring system that can timestamp packets using a synchronized clock to measure network and trading-path latency. "We created a solution where we timestamp all the incoming and outgoing data packets using standard time synchronization protocols from a GPS-synchronized master clock," said Gurgel. "All the messages that pass through our trading network are processed by the FPGA board." In addition to the market data solution, Flowa plans to also make this monitoring capability available to clients.

Flowa's solution also performs onboard decoding for B3 market data feeds, and performs state and order book management for the trading instruments, which is then distributed through the board for consumption by Flowa's execution stack. "We now handle the market data for both equities and derivatives and distribute this information through the board," said Gurgel, adding that the capability allows both local institutions and global firms to trade in Brazil, without the need for their own FPGA codebase for market data handling.

Flowa designed its infrastructure to align with evolving exchange methodologies in Brazil, enabling compatibility with global market data standards and support for multiple exchange feeds. "The stock exchange in Brazil has shifted its methodology for how customers handle and process market data, making it more similar to other exchanges around the world," said Eduardo. "Our solution already uses this approach, making it easier to adapt to other markets and conform to local protocols while consolidating data from multiple exchanges with the FPGA."

RESULT

In comparative testing, Flowa observed that software-based decoding introduced latency of roughly 20 microseconds, while full FPGA fabric processing achieved an average of approximately 216 nanoseconds in earlier implementations. "After migrating to the Alveo V80, the average latency was brought down to 67 nanoseconds, with a standard deviation of 9 nanoseconds," Eduardo said.

Beyond raw latency improvements, Flowa emphasized deterministic behavior under heavy message rates. This is particularly critical in futures products where the demand for ultra-low latency is extreme, and systems must handle millions of messages per second while maintaining consistent processing times.

In parallel, the FPGA-based monitoring capability is designed to provide consistent, independent measurement of round-trip timing and system reaction time to market events. This visibility allows Flowa to tune its algorithms more precisely and validate network performance across its trading infrastructure.

Looking ahead, Flowa plans to broaden access to these capabilities through service and licensing models, including enabling external participants to deploy Flowa-designed FPGA functionality within its own environments.

ABOUT FLOWA TECHNOLOGIES

Flowa Technologies is a Brazil-based financial technology company that develops electronic trading infrastructure for capital markets. Founded in 2010 and headquartered in Rio de Janeiro, the company provides multi-broker trading platforms, market data services, algorithmic trading tools, and order management systems for brokers, asset managers, and other institutional market participants trading on Brazil's B3 exchange.

ABOUT AMD

For more than 50 years, AMD has driven innovation in high-performance computing, graphics, and visualization technologies. Billions of people, leading Fortune 500 businesses, and cutting-edge scientific research institutions around the world rely on AMD technology daily to improve how they live, work, and play. AMD employees are focused on building leadership high-performance and adaptive products that push the boundaries of what is possible. For more information about how AMD is enabling today and inspiring tomorrow, visit the AMD (NASDAQ: AMD) website, blog, LinkedIn, and Twitter pages.

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