

# Brand-new, Fast Growing Stock Exchange MEMX Relies on the Azul Platform for Best Cost, Performance, and Support across Its Java Estate



**With a diverse group of financial leaders as founding investors, MEMX seeks to change how stock trading is done.**

- On May 5, 2020, MEMX received approval from the Securities and Exchange Commission to operate as a national securities exchange.
- On Sept. 21, 2020, MEMX went live with its first sale (100 shares of Consolidated Edison Inc. for \$73.90 a share).
- On Oct. 29, 2020, MEMX extended its initially-limited trading to all U.S. exchange-listed securities.

*This is the story of the role of Java and the Azul Platform in MEMX's development.*

## **To Create a New Kind of Stock Exchange**

In 2019, nine major financial organizations joined together in founding a new, members-owned stock exchange, the Members Exchange, or MEMX. The goal was to deliver a lower-cost, more transparent, more end-user-focused exchange platform that would compete with the major equity exchanges—NYSE, Nasdaq, and CBOE—which, many felt, had a stranglehold on the market and were charging exorbitant fees.

MEMX's nine founding members included Bank of America, Charles Schwab, Citadel, E\*Trade, Fidelity Investments, Morgan Stanley, TD Ameritrade, UBS, and Virtu Financial. Several other financial services giants joined the membership with additional strategic financing in subsequent rounds, including BlackRock, Flow Traders, Goldman Sachs, Jane Street, JPMorgan, Manikay Partners, Wells Fargo, and Williams Trading. Overall, the initial investment exceeded \$135 million.

***"This is a very well-funded and supported startup," says MEMX Chief Operating Officer Tom Fay. "I knew if we built a state-of-the-art exchange, we would be able to take advantage of our position and benefit from some fairly stiff tail winds."***

MEMX's explicit mission from the beginning was "to increase competition, improve operational transparency, reduce fixed costs, and simplify the execution of equity trading in the U.S." To achieve these goals, MEMX needed to create a simpler trading platform that would benefit both retail and institutional investors, including:

- Limiting the number of order types to promote simple and transparent interactions
- Investing in the best and latest technology to deliver fast and efficient execution
- Reducing pricing on market data, connectivity, and transaction fees

## **The Choice of Java for a Greenfield Exchange**

"The thing that attracted me to MEMX, was the chance to build something from scratch," says Fay. "The greenfield opportunity at MEMX was very real and unequivocally encouraged and supported. Given my years of experience in the space, I felt that accumulated technical debt and complex change driven by the regulatory apparatus had made innovation and technology insertion increasingly

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difficult over time. Having the opportunity for a fresh look at the problem in the context of new and emerging technologies that could be brought to bear, was an incredible opportunity."

Chief Technology Officer Dominick Paniscotti remembers the situation in a similar way. "We were very much looking to be the technology thought leaders in this space, to bring modern technology to bear and to put our best tech foot forward," he says. "Java has become the dominant language in the financial services space because of its portability, stability, reliability, security, and ease of update."

## The Choice of Azul

But, there's always a but. "The business logic of our trading platform is much better served with Java than with C++, but—" says Paniscotti, "Java also has several shortcomings that Azul has helped us address."

"Given our size and launch timeline, we had to thoughtfully consider where we wanted to take technology risk and where we didn't," said Fay. "We knew we wanted the portability and stability of Java but didn't want to expend resources addressing runtime performance nor be exposed to unnecessary commercial licensing and support costs."

"We chose to work with Azul to de-risk the technology build and allow our team to focus on developing business logic", continued Paniscotti, "We got our Java signed, sealed, and delivered from the Java experts, and could keep our singular focus on creating the best exchange."

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**Dominick Paniscotti**

Chief Technology Officer MEMX

For all developer Java-based workflows, MEMX deploys **Azul Platform Core**, an Oracle-equivalent Java bundle which includes support for Azul Zulu Builds of OpenJDK, Azul Mission Control and other curated components, to ensure easy transition and ready Java production deployment, all backed by the industry's best support and maintenance offering. The product typically reduces Java support and licensing costs (compared to Oracle's) by as much as 90%.

However, for mission-critical, performance-sensitive Java platforms, MEMX deploys **Azul Platform Prime**, based on Azul Zulu Prime Builds of Open JDK, powered by a runtime that delivers superlative performance, scale, consistency, efficiency, and improves capacity. One such platform is the mission-critical Exchange application, where execution speed must be as consistent as it is fast. Eliminating pauses/delays in application performance, and ensuring rapid application warm up led MEMX to deploy Azul Platform Prime. From inception to deployment, the integral platform took less than a year to build, delivering microsecond performance for critical processes.

## Contact Azul

385 Moffett Park Drive, Suite 115

Sunnyvale, CA 94089 USA

☎ +1.650.230.6500

[www.azul.com](http://www.azul.com)