Case Study
Bolsa Mexicana de Valores
(Mexican Stock Exchange)
Intel Corporation
Customer Reference Program

Formula BMV: Zero to 100,000 transactions in 0:01 second

The Mexican Stock Exchange (BMV) Deploys New Technology and Reinforces the World-Class Competitiveness of the Mexican Market

Just like champion single-seater race drivers, business champions know that to stay competitive, it is vital to stay at the leading edge of technology. This is why industry leaders are those organizations that have been able to anticipate the effects of technology trends, as well as to leverage the opportunities offered by those new technologies. It is such a discipline that has propelled Grupo BMV to the top tier of the world's most competitive stock exchanges, because it features speeds and latencies that place it among the planet's quickest markets.

Widely acknowledged for its commitment to offering a quick and reliable trading system, the BMV has become a synonym of quality and high levels of service. The BMV's focus on achieving its brand's mission and promise led it to design and deploy a trading system that allows it to respond to market-volume fluctuations and shine as one of the world's most effective and efficient systems.

The Challenges

- Greater Power. The stock market demands high computing power. The speed at which transactions are resolved is directly related to service quality.
- Higher Performance. Fluctuating demand for services mandates a high-performing and reliable transaction system able to keep apace of drastic demand variations.
- Scalability. The stock market requires technology that is scalable and able to grow extensively, in order to easily—and cost-effectively—address the growth challenges of the Mexican market.

The Solution

- High Performance. In order to meet the extreme computing demand of the stock market, the BMV designed a proprietary system that combines two HP DL380 Intel® Xeon® X5680 processors running an optimized version of Java.

Outcomes

- Higher Capacity. The BMV's new system currently has the infrastructure to handle up to 100,000 transactions per second—significantly more than the 1,000 transactions per second limit of the prior system. It would be simple and cost-effective to increase capacity and handle even more transactions per second.
- Increased speed. The new performance means the response capability of the BMV has improved hundreds of times. Today, the system handles transactions under 90 microseconds apiece, compared to the rates of between 35 and 90 milliseconds achieved by the prior setup.
- Maximum Security. A series of filters prevents the handling of operations that exceed set volume and price ranges without affecting system performance.

"We executed the BMV's technology renewal with a true vocation for excellence and seeking to contribute tangible value to the country by providing Mexico with a highly-competitive, world-class stock market. MoNeT, our new technology, allows us to offer a much larger and more active market, with room for much larger numbers of investors and making the Mexican market much more attractive internationally."

– Dr. Enrique Ibarra, Deputy Chief Technology Officer of the BMV

Changing Hurdles into Inflection Points

In 2006, as a result of changes in the way investors generate their positions, the BMV was facing a major challenge. New and evolving technologies resulted in an exponentially sharp increase in the number of transactions received by the market. As its clients embraced these new technology tools to implement electronic algorithms and program the automation of buy, sell, and cancel positions, the BMV was evaluating how to leverage those same breakthroughs and offer enhanced services. With this in mind, it focused on leveraging new technologies to implement a system able to handle the required demand while offering consistently secure and stable service. Driven to remain one step ahead of other systems worldwide, and in the belief that market competitiveness is directly related to the competitiveness of its IT system, the BMV launched an ambitious system to replace and upgrade the system that operates the securities market in Mexico. The result was MoNeT: a nimble and versatile IT system developed by the software engineers of the BMV's Techology Division as a key element of its long-term technology renovation.

The Home Stretch toward Higher Computing Capability

Considering that between late 2006 and early 2013, transactional trade demand at the BMV rose from 75,000 puts per day to more 7.3 million, the BMV's priorities along the design of the new system revolved around meeting the growing performance needs resulting from increased demand. Besides a new system that enabled operators of Mexico's financial markets to negotiate their transactions faster, it was also essential to implement high-performance technology that would enable future enhancements without a need to replace the system outright.

For this reason, the BMV focused on finding a scalable platform that offered top performance along with the highest computational power. With this goal in mind, the BMV decided to evaluate the Intel Xeon X5680 processor as it worked on the design of today's MoNeT.

Free, Efficiency-Focused Practices

With the help of the Software Engineering Institute (SEI) of Carnegie Mellon University, the software engineers of the BMV's Techology Division focused on the mission of testing various

technologies with the goal of identifying the software platform that would enable the quickest and most effective execution. Intel provided the BMV with equipment that included physical servers as well as remote access to the Intel® Faster Lab. Using the Intel hardware, the BMV conducted in-house testing that enabled countless and detailed studies and assessments.

"We initially suspected that hardware with technical specs showing higher clock speeds would enable the highest execution speeds. Nonetheless, the tests showed that clock speeds weren't crucial to performance. It was the Intel platform that provided the best application performance, among all the hardware systems we tested", explained Dr. Enrique Ibarra, Deputy Chief Technology Officer of the BMV.

The Intel Xeon X5680 processor, featuring an Intel 12M smart cache and clock speed of 3.33 GHz along with the 6.40 GT/s Intel® Quick Path Interconnect (Intel QPI), was the processor offering quickest and highest performance and output.

The final platform is comprised of two servers featuring Intel Xeon X5680 processors and configured as an active-passive cluster. At the same time, there's another system with an Intel Xeon X5680 processor at a secondary data center, which receives the production workload in real-time and would work as a backup in case of a disaster at the primary data center.

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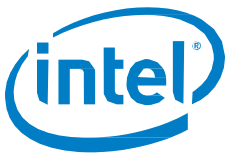
At the Peak of High Performance

Today, the computing-capacity constraints that the BMV had been facing due to explosive demand growth have been resolved via a nimble system that simultaneously offers high availability rates and extremely competitive speeds, despite the ever-increasing demand. Thanks to the MoNeT system, Mexico's capital and derivatives market features enhanced competitiveness, stability, and security. Because the system performs the entire processing in-memory, the BMV has become highly efficient, which has enabled it to increase the liquidity and depth of the Mexican securities market by a factor of more than 50%.

It is expected that the platform will remain up and running for at least 10 years going forward. Meantime, its design deliverables are now a tangible reality, and Mexico now has in place a dramatically-enhanced securities market thanks to the launch of the new MoNeT technology platform.

Moreover, with the inception of this new system, the BMV was able to significantly cut its operation costs.

With the enhancements of this new platform featuring Intel® Xeon® technology, the Mexican securities market is now more attractive and competitive. The BMV has reached a new record of 7.3 million transactions in a single day—a substantial increase versus the maximum 75,000 transactions per day that were possible before the system was upgraded.



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