

iX-eCute FPGA (Field Programmable Gate Array)

Case Study: Risk Controls in Canada

Protecting Markets

Fixnetix is a company that understands innovation. With new regulatory regimes introducing trading controls for multiple asset classes in multiple jurisdictions, the need arose to convert these new demands into operational actuality via the effective use of technology. Fixnetix has risen to prominence through the delivery and support of technical solutions to the electronic trading community, operating in the worlds' main financial centers and supporting the global trading community.

Background

In line with changes introduced in other markets around the world following the so called 'Flash-Crash' in 2010 and the collapse of a US broker following a near catastrophic trading error in 2012; the Investment Industry Regulatory Organization of Canada (IIROC) provided their regulated dealers with clear supervisory and gatekeeper responsibility to protect against errors related to electronic trading; these rules and the subsequent amendments, were approved by the Canadian Securities Administrators (CSA) in the form of NI 23-103 Electronic Trading.

The changes were to become effective as of March 1, 2013 however, in recognition of the technology enhancements required to automate the controls, IIROC dealers had until May 31, 2013 to fully test and implement their automated controls and replace existing systems or introduce new functionality.

The Canadian Investment Bank considered here was predominant in providing direct exchange access market in Canada and wished to retain this position by continuing to provide a 'white gloves service' to their client base. The conundrum however, was how to effectively introduce the changes without introducing unnecessary latency that would reduce clients trading performance.

The Challenge

Fixnetix already had a software based solution in place in with investment banks and their clients in Europe and were working on reducing risk control introduced latency even further by porting to a FPGA based proprietary hardware solution (iX-eCute), thereby removing the software stack from the in-line controls and minimizing the latency. Fixnetix had an iX-eCute test rig already established in the US on an equity exchange but had nothing available at that point in Canada. Fixnetix and the bank embarked on an educational program to make clients aware of what was achievable with such a solution and to make sure that the solution was sufficiently altered in order to be fit for purpose to the vagaries of the Canadian marketplace. Clients were encouraged to connect first to the US market and then to a test environment initially set up at the TMX co-location center and then at the Equinix TR1 data center thereafter.

The Solution

Fixnetix and the Canadian Investment Bank worked in partnership to deliver a bespoke solution in order to meet client needs in terms of functionality, latency, scale, reliability and implementation. The controls were tested in conjunction with clients over a period of weeks, with new functionality drops becoming available periodically containing over 100 items such as maximum and minimum share quantity, price deviation, order value, trading limits, short sale and pre-borrow rules, GTD, GTC, single cancel, multi-cancel, cancel on disconnect and 'kill-all'.

Multi-user profile monitoring and intra-day amendments were made possible via a Fixnetix proprietary GUI called iX-Eye. Client configuration and status was viewable and filterable with various warning alerts configured so that client limit breaches could be highlighted and avoided prior to any breach occurring. Additionally, a full audit trail was required as a matter of course.

The system needed to be robust enough to take massive client order flow over multiple sessions, refer to start of day files, client configuration files, real-time market data and provide an order-by-order report of the days' trading. Message stores needed to cover millions of messages with hour-long burst rates of more than 10,000 orders per second. The latency of the system needed to be imperceptible to the 'static' in the marketplace.

The Result

The bank was able to launch within the regulatory timeframe, keep their client base happy, protect their clients and the bank and yet maintain the sophisticated trading regime that they had enjoyed up to that point. The environment has provided a robust platform for future volume growth and a solid platform to allow the bank to target further customers. The conclusion that we offer is that whilst new regulation is often daunting when first read, it need not be feared in a technology sense and seen as an impediment to business. Rather, new regulatory regimes can provide opportunities for market participants to safeguard their own and their clients business by embracing new technologies. New regulatory and compliance checks can now be implemented within an ultra-low latency trading environment without impacting the performance of the trading strategies deployed. Additional controls can be tracked and erroneous orders can be halted in flight without impacting the rest of the order flow- even when the throughput is in millions of orders per second at nanosecond latencies.

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