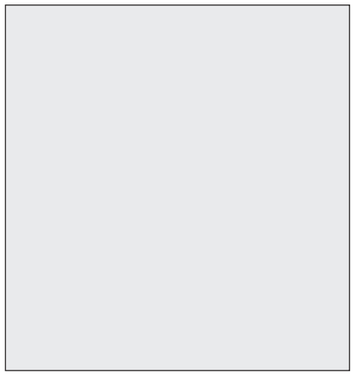
e-Forex Case Study

Currenex:
Tackling the Latency Issue

*e-Forex asks **Sean Gilman**, Chief Technology Officer at Currenex to tell us how they are tackling the problems of latency.*



Sean Gilman

Introduction

With a continuing investment in developing enhanced technology, Currenex – a leading multibank FX trading platform – has focused on what is one of the most vital aspects of today's online trading: SPEED. In migrating to a Linux open source environment they have established a competitive advantage in what they believe is a crucial facet of future success.

Currenex seeks to maintain a technological edge amongst FX trading platforms, knowing full well that such a determination could be the difference between feast and famine in the increasingly competitive FX arena. Currently, the growing adoption of electronic trading in FX is following the same course set by equities, derivatives and fixed income. However, the fact is much of what passes for "electronic trading" in FX is relatively unsophisticated and unsustainable. Other market experiences demonstrate that the quality of technology becomes the key determinant of which trading platforms flourish and which collapse during the period of inevitable consolidation. FX will be no different. With that in mind, Currenex's technology focus has been on reducing latency to an absolute minimum. An important aspect of Currenex's quest for limiting latency has been the migration to a faster Linux operating system.

The Importance of Speed

To understand the motivation behind the migration is to understand the overall importance of speed as it pertains to the challenges of execution in FX. RFQ (Request For Quote) and RFS (Request for Streams) workflow emulates trading over the phone, and there was less need to focus on latency when this was the dominant mode of trading FX. With the emergence of ESP (Executable Streaming Pricing), e-FX has evolved due to the fact that this mode of trading is decidedly faster than RFQ. The ESP model is extremely time sensitive.

For streaming rates, the two forces driving FX platform success are access to liquidity and speed (low latency). A customer will look for the destination where there is the best chance of getting executed; in other words the ECN with the deepest and tightest order book. However, speed is an equally important decision factor when choosing where to route an order. In particular, low latency technologies provide market participants with the most efficient executions (i.e. lower cost of execution, less slippage, etc.). In contrast, high latency systems cause poor execution, slippage, and allow for the "picking off" of market makers (i.e. banks). As a result, market participants – whether they are banks or buy side firms – will migrate to platforms with good initial liquidity and low latency. Put simply, volume will go to the fastest.

For example, a trader might wish to execute a fill or kill order. Due to latency, in a fast moving market with multiple ECNs available, the trader doesn't actually know the exact liquidity available at a given instant at each destination. In reality, the trader only has an approximation of the available liquidity based on market data. The accuracy of the approximation is inversely proportional to the time it takes to receive the market data plus the time it takes to submit an order to the ECN. Therefore the trader needs to make a strategic decision about which ECN should receive the order first. By reducing the "opportunity cost" (i.e. time) that a trader takes in routing an order, the destination with the lowest latency has an edge. It is this competitive advantage that Currenex has created.

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In 2003 Currenex entered into a strategic relationship with Hewlett Packard to design and develop the optimal systems environment for low latency FX trading. As a result of this joint effort, Currenex has been able to reduce the execution latency to levels of less than 10ms, and this effort continues with the goal of reducing execution time to the microsecond (sub-millisecond) level.

Continuing the partnership with HP, Currenex has migrated its system to a Linux environment, running on Intel Xeon and AMD Opteron processors, to achieve greater speed. Before making the decision to move to Linux, Currenex built a test suite to measure the benefits. "We built tools to measure each step of the order execution process and have used that information to locate and streamline processing bottlenecks," says Currenex chief technology officer Sean Gilman. "When we were done, we saw a 75% reduction in processing latency and three fold increase in maximum throughput." Looking ahead, Currenex plans to perpetuate the benefits of this process as it continues to develop. "We chose Linux because of the performance/cost curve," adds Gilman. "We plan to refresh our hardware every six months and stay on the fastest boxes money can buy.

Practical Benefits of Speed

The focus on speed allows Currenex to overcome some of the obstacles inherent to online trading. In the process of connecting banks with their customers, the Currenex platform processes approximately five thousand spot orders per second. Additionally, each order can have its own options (partial fills, stop-loss, take profit, etc.) which makes the process more complex. Further, the sorting of the order book needs to be "atomic", meaning the work can't be split between multiple processors or threads because that could create inconsistencies. This is a particularly computation intensive part of the system that Currenex has focused on accelerating with the upgrade to the faster Linux processors (see Figure 1).

The liquidity at a given ECN destination is constantly moving, causing the prices to change. If prices are updating every 50 milliseconds, any latency above 50 milliseconds can result in sub-optimal execution. If a trader sends an order to a slow ECN, the market can have already moved before the trader even knows if the trade has been executed. Even 50 milliseconds of latency can cost a customer or market maker a couple of pips in execution. "Our customers have an advantage with us because they have faster access to liquidity than their competitors," says Gilman. "Instant access to these volatile markets makes a difference as to whether a trader makes money or chases the market, therefore a key component in our superior execution performance is, and will be, limiting latency."

Better Trading

Reduced latency also means more effective blackbox model trading. With faster execution, black box traders will experience less slippage in their models. Unlike their competitors, Currenex does not throttle customer orders, meaning there is virtually no limit to the amount of orders that can be entered per second over the platform. During typical traffic the Currenex matching engine handles about 5,000 messages per second, and has experienced peaks of 11,000 per second. The system has been tested in a controlled environment at 25,000 messages per second. Because the system is so fast, order-throttling techniques employed by other platforms are not necessary on Currenex.

Throttles drive liquidity away for the simple reason that platforms employing throttles will not keep up with a volatile market. Rejected orders will clearly mean less liquidity and lost opportunity. Furthermore, Currenex provides market updates in real-time along with displays of market depth. By contrast, the leading interdealer system's market data is only updated every _ second, which is, at best, merely indicative of the market and not a reflection of prices that can be transacted.

Market makers garner benefits from reduced latency as well, as speed will also contribute to a more balanced exchange. A platform like Currenex can ensure fairness to both sides since speed of execution can help banks avoid potentially harmful arbitrage situations.

Figure 1

Legacy of Innovation

Currenex builds, owns, and operates its own technology and is focused on maintaining its advantage by continuing to invest in technology and foreign exchange expertise. Their association with HP and Linux has been another step in this process. Thanks to a technology advantage, Currenex has positioned itself as the best platform for model trading and the best for market making, which subsequently results in unbeatable liquidity. Sustained profitability in FX – for the buy or sell side – requires a high-performance trading platform that can capitalize on speed. Currenex has made this idea a reality.