FASTER GLOBAL FINANCIAL TRADES: TMX ATRIUM PROVIDES LOW LATENCY CONNECTIVITY 24/7

Summary

Company: TMX Atrium

Industry: Financial Services

Challenge: Build enterprise-grade wired and wireless network to deliver broadcast quality video and voice.

Selection Criteria:

- Provide a low latency network that meets the stringent demands of global financial market participants
- Enable clients to consume ever increasing amounts of market data faster and easier, and support multicast delivery
- Create a highly available, flexible, robust, and secure network

Network Solution:

- Juniper Networks EX Series Ethernet Switches
- Juniper Networks SRX Series Services Gateways
- Juniper Networks MX Series 3D Universal Edge Routers
- Juniper Networks QFX3500 Switch

Results:

- Reduced on-boarding of new customers from four-six weeks to five days
- Increased network simplicity and improved business agility to penetrate new markets
- Improved customer service and faster problem resolution
- Reduced average failover time from 30 to just 2 seconds

Every Millisecond Counts

Continued exponential growth in the volume of financial market data is showing no signs of slowing, and this is placing increasing infrastructure demands on organizations servicing the needs of the global financial markets. It is estimated that every millisecond lost in transaction processing for a brokerage firm can result in $100 million per annum[1] in lost opportunity. Whether on the buy side or the sell side, these companies depend on resilient networks and robust infrastructures to enable them to consume, manage, and act on market data quickly, reliably, and securely.

TMX Atrium provides high performing fiber-optic infrastructure that is flexible and scalable to financial services organizations that rely on low latency transaction execution to meet changing needs at an attractive price. Its business model is founded on innovation and agility. It takes an intelligent approach to its business, investing in sophisticated technology that makes the network more effective, streamlined, and efficient—allowing participants to benefit from a simple method of connection onto the global financial markets.

With a presence in 12 countries across North America and Western Europe, expansion to new geographies and into new asset classes, offering connectivity to 27 major trading venues, TMX Atrium's network needs to be robust, fast, highly accessible, and highly secure.

A Laser Focus on Financial Services

A financial services infrastructure provider handles market data feeds of 2.1 million messages per second.[2] TMX Atrium differentiates itself from competitors with a pure financial services focus, enabling it to meet the very specific needs of this demanding market. "Our customers come to us because of our focus," says Emmanuel Carjat, managing director at TMX Atrium. "Their efforts are spent transacting, providing data, or providing a brokerage service. Running a network is secondary to what they do, so having a secure, robust, and cost-effective network to rely on is critical to their business. It is relatively simple for them to connect to one entity, but connecting to multiple entities becomes progressively harder and more expensive to manage. We do this for them, enabling them to reduce connectivity fees."

TMX Atrium's business hinges on its ability to deliver high-speed connectivity to its customers, and to partner with the right network equipment provider to offer cutting-edge technology. In order to meet its business goals and aggressive plans for expansion, it is vital to partner with a technology provider such as Juniper Networks with a similar ethos of innovation and understanding of its business. This helps build customer confidence and provides innovation that TMX Atrium can develop into new products and features for its customer base.

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[1] http://tech.slashdot.org/story/11/09/13/0258217/300m-to-save-6-milliseconds

[2] www.automatedtrader.net/online-exclusive/80415/market-data-maelstrom

Low Latency and Reliability: Increasing Profitability

TMX Atrium's focus on the evolving financial services industry places continual demands on the latency and throughput capabilities of its infrastructure. Financial market data feeds such as OPRA and ARCA are reaching levels of 1.6 gigabits of data per second[3] and growing continuously. Latency intolerant market players need to consume the data and react to market events faster than their competitors to increase the profitability of their trades. Most equity venues are now using multicast protocol, which broadcasts one information packet to multiple recipients within a network to ease the workload on their servers. Distributing multicast reliably, across a wide area network at the lowest possible latency, ensures that market participants can trade efficiently and helps avoid high latency retransmission delays.

TMX Atrium's customers are also highly focused on infrastructure availability and require network providers that understand the importance of avoiding outages, and can offer reliability, speed of connection, and ease of implementation.

"Our network was engineered to evolve to meet the needs of our financial services clients; standardized use of Juniper Networks and its technology enables us to provide the speed, flexibility, and low latency our clients demand," says Des Peck, head of product and marketing at TMX Atrium.

> "Juniper Networks has improved our business agility by enabling us to respond quickly to changing client and market needs, quickly deploy new POPs where needed, and penetrate new markets. Our clients have confidence in our ability to deliver low-latency 24/7 connectivity, and Juniper Networks provides the reliability and availability our clients need at a low operational cost."
> - Des Peck,
>   Head of Product and Marketing at TMX Atrium

A Global Core Network to Underpin the Trading Lifecycle

The lifecycle of a trade originates at a venue when emerging market data acts as an information signal to trading participants. This information is fed into trading devices and enables participants to execute their trading strategies. An order may then be created, which is sent back up to the originating venue where it is matched. This continual flow generates additional data and a need for downstream clearing, settlement, and depository functions to be performed. Throughout the lifecycle of the trade, multiple parties are engaged in the transaction, ranging from brokers, clearers, independent software vendors (ISVs), market data providers, and venues—all of which rely on continual and reliable data flows. To meet these demands, TMX Atrium designed and built their financial services extranet bringing together multiple trading participants. The firm's simple approach to connectivity ensures that customers connect quickly and easily to their desired trading counter parties in a highly flexible and secure way.

To build a global core network to underpin the trading lifecycle, TMX Atrium has 25 points of presence (POPs) throughout Canada, the United States, and Europe. It locates its POPs in data centers where there are large trading venues and consequently large liquidity pools (e.g., NASDAQ in New Jersey and BATS/Chi-X in London). Based on Juniper Networks® EX Series Ethernet Switches and SRX Series Services Gateways, Peck explains why this approach was taken:

"Deploying a POP within a large venue gives our clients immediate access to that venue and the available liquidity. Clients clustered around the POP plug into our network, and our network participants quickly and from there connect out to other locations. If a trading strategy doesn't work out, our network is flexible and can take them to a new venue quickly," Peck says.

From the Edge to the Core

TMX Atrium uses Juniper Networks equipment at the edge as a client device, and also at the core of its network. EX Series and SRX Series devices are deployed at the core of the network and the EX Series is used at the edge for clients who want to use multicast. As Peck explains, "We use the EX Series at client sites to support multicast, as they consume the multicast quickly and can send up to several hundred megabits per second (Mbps) of data. As the demand for data on TMX Atrium continues to grow, we look for effective ways to address trends such as the move towards multi-gigabit multicast. Deploying Juniper Networks MX Series 3D Universal Edge Routers at the core and the Juniper Networks QFX3500 Switch as an aggregation layer device and with advancing future requirements in mind, we can easily upgrade our network to support multi-gigabit multicast. The MX Series supports exchange data feeds like OPRA and ARCA, and this gives us the scale to deploy new POPs in new geographies and be a step ahead of our customers' requirements."

TMX Atrium uses Juniper Technical Services for help with issues or unknown features, and it has used J-Labs to trial the MX Series and QFX3500, working with Juniper technicians to shape its delivery in a risk-free lab environment. This foresight and understanding of how critical the network is to their clients' business, along with TMX Atrium's ability to execute now and be prepared for future demands, has already led to them signing up new clients on the basis of using the QFX3500 to connect to an exchange and be able to consume OPRA and ARCA feeds.

"The market data feeds we deal with, typically reach speeds of 1.6 gigabits of data every second. To put that into context, this is equivalent to one movie being downloaded over the Internet every eight seconds. We use the QFX3500 switches to be able to distribute this level of data quickly and reliably across our network in just a few microseconds," Carjat says.

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[3] 1.6 Gbps based upon advice from NYSE of ARCA Options being measured at a 10 ms interval www.nyxdata.com/Support/Market-Data-Capacity-Figures

Tangible Customer Benefits and Business Impact

TMX Atrium now has Juniper equipment throughout its environment, underpinned by the Juniper Networks Junos® operating system, which brings significant benefits. The migration to Junos OS was straightforward, and the operations staff was up and running quickly on the new operating system thanks to Juniper's expertise and using Junos OS on the edge. All of TMX Atrium's edge and core devices are Juniper running on the Junos OS, making it much easier for the operations team to support clients. "If a client can't get in touch with an exchange, Juniper's support staff can quickly identify where the problem is and work to resolve the issue live," Carjat says. "This responsiveness and ability to quickly find the root of a problem comes down to the operational simplicity of Junos OS as the backbone, with one operating system, one release train, and one modular software architecture."

TMX Atrium future-proofs its network, anticipating changing client needs and preparing for them. Working with Juniper Networks, TMX Atrium is able to turn new product features/functionality into new client offerings and get them quickly to market. TMX Atrium has used a combination of Juniper's groundbreaking Bidirectional Forwarding Detection (BFD) protocol, Reservation Protocol (RSVP,) and Link State Advertisement (LSA) functionality to offer clients a faster failover time and higher availability—instead of a few seconds outage, a secondary path is activated in less than 50 milliseconds.

"As our clients' IT departments reduce spending on their individual networks, we perform an increasingly important role in their businesses. We help firms future-proof their own TMX Atrium connectivity investment by offering a network that has the necessary bandwidth to scale from 40 to 100 gigabits in anticipation of future connectivity pressures. Partnering with Juniper Networks also provides the opportunity to run exhaustive testing in a non-live environment which acts as a test bed for our future network development plans," Carjat says.

Another benefit of the Juniper solution is reduced Total Cost of Ownership (TCO). The value delivered by the Juniper solution enables TMX Atrium to offer clients best-in-class, innovative technology and draws upon the homogenous Juniper platform and simple operational support required by TMX Atrium. "Using Juniper has helped us move up the value chain from a low cost network services provider to one of the leading global infrastructure specialists with a presence in multiple markets. The Juniper solution combined with our operational approach and focus gives us a compelling market proposition."

As Peck concludes, "Juniper Networks has improved our business agility by enabling us to respond quickly to changing client and market needs, quickly deploy new POPs where needed, and penetrate new markets. Our clients have confidence in our ability to deliver low latency 24/7 connectivity, and Juniper provides the reliability and availability our clients need at a low operational cost."

Next Steps and Lessons Learned

TMX Atrium continues to actively develop its platform with Juniper Networks and to plan for future growth in line with the demands from the financial services community. TMX Atrium is capable of supporting 10 Gbps now, and as market data feeds begin to grow and clients become increasingly reliant on performance, latency, and reliability, TMX Atrium has the capacity to scale up to 100 Gpbs.

For More Information

To find out more about Juniper Networks products and solutions, please visit **www.juniper.net**.

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About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at **www.juniper.net.**

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