ELECTRONIC STOCK EXCHANGE IMPROVES NETWORK RELIABILITY TO KEEP TRADES FLOWING

100 Percent up time maximizes member satisfaction

"Net Optics provides direct in-line visibility into our real-time trading traffic without incurring latency or impacting the traffic in any way."

Multi-station Taps

Customer:
Philadelphia Stock Exchange

Objective:
Provide non-intrusive, zero-latency visibility into network traffic enabling trading transactions to be captured and network issues to be resolved quickly and accurately

Approach:
Tap into the network with Net Optics multi-station fiber and copper Taps

Technology Improvements:

- 100 percent direct in-line traffic visibility in real time without latency or impact on real-time applications
- Ability to record transactions for event reconstruction to resolve differences between the Exchange and its members
- Ability to analyze traffic from multiple vantage points throughout the network simultaneously

Business Outcomes:

- Improved network reliability from "four nines" (99.99% up time) to five nines (99.999% up time) in first year
- Achieved virtually 100% up time by the end of the third year
- Improved end user satisfaction by consistently providing more reliable low-latency access into equities, equity options, and futures markets

Electronic Trading Requires Top Network Performance

Founded in 1790, The Philadelphia Stock Exchange (PHLX) may be the oldest stock exchange in the United States, but its electronic trading technology is on the leading edge, and is recognized throughout the industry for its speed and accuracy. The Exchange, which has been part of NASDAQ since 2008, has more than 200 listed members. Like all electronic trading exchanges, its primary goal is to provide reliable, low-latency trading capabilities to its members.

When trading is done electronically, the network is your business. Perhaps more than any other type of organization, network performance–especially low latency–and reliability are essential. To provide its members with the highest possible performance, the Philadelphia Stock Exchange was running a high-speed Gigabit Ethernet fiber network. Their Network Operations teams needed to attach a variety of monitoring tools to this network without affecting the traffic or introducing any additional latency. In addition, they wanted to capture trade transactions at different points throughout the network in order to monitor and tune network performance. It would also give them the ability to reconstruct transactions should discrepancies arise between the Exchange and any of its members.

Taps Provide the Answer

What technology could provide the monitoring access the Exchange required? Certainly not Span ports–they can impact data flow, and they may drop packets when the switch experiences high utilization–which is precisely when visibility is most critical. Span ports also introduce latency in the monitoring path and drop some of the traffic such as packets with CRC errors, which can severely limit the ability of tools to properly capture traffic and support staff to accurately analyze problems.

Another undesirable aspect of Span ports is the frequent need to reconfigure production switches to provide visibility of the particular traffic that needs to be analyzed at any given time. Switch reconfiguration can be risky because of the possibility of human error as well as potential audit and SOX compliance concerns.

The Exchange's need for 100 percent traffic visibility with no impact on the traffic and no latency could only be met by one technology, in-line network Test Access Ports. Taps pass all of the link traffic, even packets with CRC errors, to the monitoring tool so difficult network issues can be solved. In addition, Taps never affect the traffic on the link, not even if the Tap loses power. When Taps are deployed in the network as permanent test access ports, traffic is instantly and transparently available to be monitored at any time.

Vendor Selection

When it came time to select a Tap technology vendor, the Exchange looked at two monitoring access device suppliers whose equipment they were already familiar with. However, they needed the most reliable possible solution to entrust with the critical links carrying their real-time trading traffic, especially for the high-traffic 50-micron 10-Gigabit fiber links running between switches.

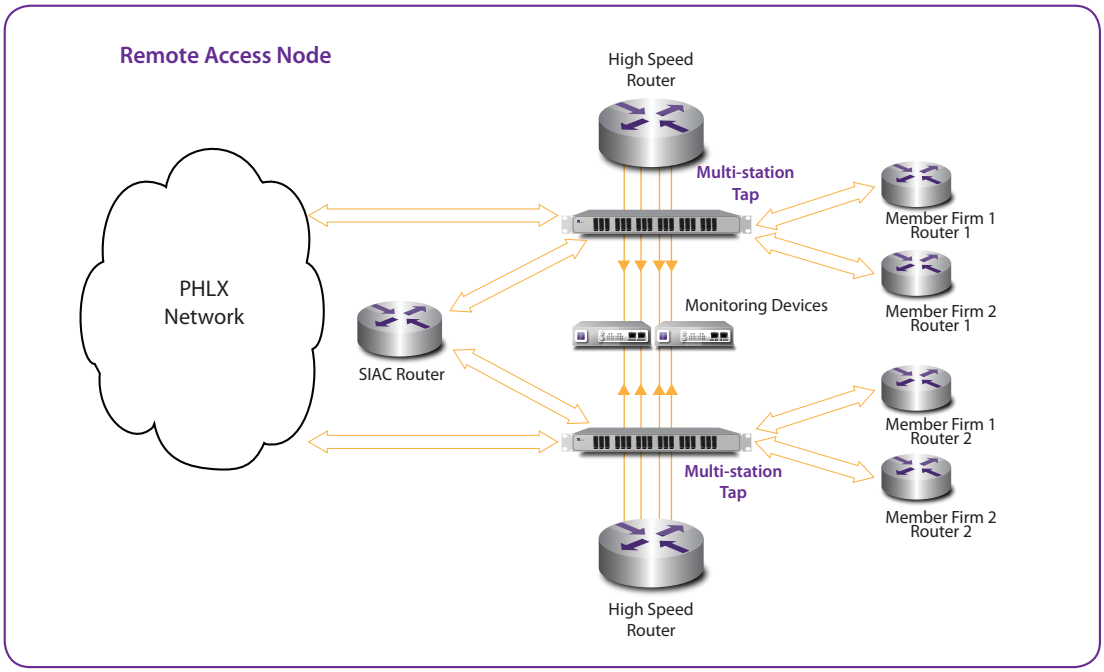
The PHLX network reliability increased from "four nines" (99.99% up time) to five nines (99.999% up time) in just the first year. By the end of the third year, the network was up virtually 100 percent of the time.

The Exchange evaluated the field of Tap technology companies and decided that Net Optics was the most reliable vendor with the most reliable products. They were pleasantly

surprised to find that Net Optics provided an advantage in cost, too, which was a secondary–yet still important–consideration for the Exchange as well.

The Net Optics Solution

The family of multi-station fiber and copper Network Taps offered by Net Optics was the perfect fit for the Exchange's needs.



Net Optics is the monitoring access industry leader in 10 Gigabit solutions, so the high end was well covered. The product family spanned the range from 10 Gigabit and 1 Gigabit fiber all the way down to 10/100/1000 and 10/100 copper, so every link in the Exchange's network had the potential to be tapped. The Net Optics solution was also efficient in rack space and power consumption, providing as many as twenty 10/100 copper Taps or six singlemode or multimode 10 Gigabit fiber Taps in a 1U 19-inch rack-mount chassis.

The right products were important to the Exchange, but equally important was the vendor's reputation. The Exchange was impressed with reports of the reliability of Net Optics products and first-rate customer service, as well as their long track record of delivering innovative Tap solutions. They were confident that Net Optics was the right choice for their network.

Delivering Business Value

With Net Optics multi-station copper and fiber Taps deployed as part of the Exchange's network infrastructure, the Network Operations teams were able to attach monitoring tools to access trading traffic on critical links in real time, whenever and wherever they were needed. Using the Taps, they could troubleshoot delayed trades and other network issues quickly and accurately. Most importantly, they were able to record transactions and reconstruct specific events when differences in trade processing timers arose between the Exchange and any of its members.

Leo Rodriguez, the Director of Network Operations at the Exchange, commented, "Net Optics provides direct in-line visibility into our real-time trading traffic, allowing packet analyzers, intrusion detection systems, and application flow analysis tools access to real-time trading traffic without incurring latency or impacting the traffic in any way."

The tools and control mechanisms they were able to deploy using the Tap infrastructure enabled them to analyze trading traffic simultaneously from different vantage points throughout the network, contributing significantly to their primary goal of providing their members with reliable and low latency trading capabilities. As a result, the PHLX network reliability increased from "four nines" (99.99% up time) to five nines (99.999% up time) in just the first year. By the end of the third year, the network was up virtually 100 percent of the time, greatly increasing members' end user satisfaction.

To learn more, visit www.netoptics.com

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