

Need to Monitor Latency, Performance and Throughput at Micro-Second Level Drives Investment Firm's Purchase of nGenius Solution

Combination of deep packet capture, robust analysis and reporting, and superior product support proves to be winning combination

Overview

Customer

The leading sector index options trading firm and one of the largest liquidity providers in Exchange Traded Funds.

Applications in Use

Market trading applications, multicast feeds, Oracle database and Citrix-based applications.

Business Challenge

Network operations required millisecond-level visibility to accurately and quickly pinpoint the cause of the application delay and latency issues affecting critical trading applications and market feed data.

Business Results

- Faster resolution of intermittent delays with market trading applications
- Identification of mis-configured clients causing packet loss and excessive WAN traffic
- Validated changes in response time, latency and utilization caused by new application deployments
- Improved collaboration and communication between network and application teams. nonproduction traffic



The Challenge

Traffic Bursts Cause Retransmissions and Delays

This leading financial institution with offices throughout the United States, Europe and Asia is focused on trading, investment banking, private equity, venture capital, institutional sales and research. It is among North America's largest option market makers, is the leading sector index options trading firm, and is one of the largest liquidity providers in Exchange traded funds.

With 1100 traders, the company places a strong emphasis on technology to stay competitive in the fast-changing, increasingly automated market trading industry where any disruption to the network can mean lost profits, dissatisfied customers or even potential lawsuits. According to Information Week, "a millisecond advantage in trading applications can be worth \$100 million a year to a major brokerage firm." Minimizing latency and accelerating performance and throughput are therefore key drivers of this institution's underlying business and the top goal of its IT organization.

Although more than 300 software developers, infrastructure specialists, testers and business analysts support the company's technology needs and the company uses a state-of-the-art infrastructure that includes 1500+ servers; an Oracle® database environment; Citrix® based applications; a globally distributed WAN supporting messaging middleware and market data services; and a modern 10,000 square foot data center, their network performance management tools were fairly rudimentary.

The network regularly experienced traffic bursts which caused retransmissions and delayed transaction speeds, but because their existing historical reporting tools offered only five- or fifteen-minute averaging, the network operations team did not have the granularity needed to see when and where these spikes were occurring or to determine the cause of these threshold violations. In addition, troubleshooting was tedious and frustrating as the tool could only capture packets on demand, making it challenging to catch intermittent problems in action.

"Latency is a key focus of ours. This is due to changes in the marketplace, such as automated trading environments and the need to be close to the market. The competition is electronic as well, so really, every millisecond does count."

- Manager of Operations

The Solution

Latency, Performance & Throughput Drive Purchase

The need for millisecond-level visibility into market data transactions drove the move to permanently instrument key locations to provide a unified, end-to-end approach to evaluating application performance and latency issues. To address these challenges, the network operations team began looking for a solution that could provide sub-second level alerts when peak thresholds were reached on critical applications and links, and to also continuously capture and store packets for retrospective problem reconstruction.

After an extensive search, the company purchased the nGenius® solution to assure that its traders got the response time they needed to succeed. The nGenius solution not only provided the necessary one-minute granularity with millisecond peak reporting intervals, but also microburst alarming on utilization of both physical and virtual circuits.

For its initial deployment, the operation group chose to instrument its dedicated WAN with several InfiniStream® appliances placed strategically in their data center and most active business locations. The purchased InfiniStream appliances were configured with 8TB of hot swappable, redundant power and drive options that enable 24x7 continuous packet capture and back-in-time analysis.

"When we had bursts, our other tools would fail us. Either they couldn't keep up with the load that was coming in or they weren't granular so they would only give five-minute or 15-minute information. The burst itself was lost. It is important to know our 5-minute averages from a trending perspective, but we also urgently need to know whether we're keeping up at the peak thresholds for capacity planning and application tuning, and the NetScout tools allow us to do that."

- Manager of Operations

Business Results

Quick Resolution of Persistent Response Time Issues

Shortly after installing the nGenius solution, the network team was notified that a number of market data applications were experiencing intermittent delay problems. In the past, the network team would have done an on-demand data capture and hope they caught the problem, but now with the nGenius solution, they were immediately able to view the application's response time for the past several hours and then break down response time into network flight time and server processing time. This information conclusively established that the problem was with the server, not the network. A review of the server conversations determine that all the clients were connecting to just that one server, which was overwhelmed and had become a bottleneck. Once network operations shared this information with the support team, they were able to quickly redirect the clients to the proper production servers and balance the load more appropriately.

"We purchased the InfiniStream appliance because when an application isn't working as we expect it to, we need to analyze it on a per-packet basis. The InfiniStream appliance's per-packet information is helpful not only to confirm whether data arrived where we expected it to arrive but also to help identify the source of the problem. The combination of having both analysis and packet capture capabilities in the same tool is really big for us."

- Manager of Operations

Resolving Intermittent Packet Loss on WAN Links

The operations team was also able to solve a long-standing but intermittent service disruption on the WAN link between two major offices soon afterwards. A routine review of performance uncovered an unexpected increase in traffic volume and a corresponding increase in packet loss. By viewing all the applications on that link and their associated volume, network operations identified two applications contributing to the bulk of the traffic and the associated clients. Further investigation showed that several of these clients were misconfigured to use a remote server instead of the local server, thus causing unnecessary WAN traffic. A quick call to the remote support team redirected the clients to the local server and WAN operations returned to normal.

Improved Planning, Reporting and Cross-Functional Collaboration

While communication between the networking and application teams has always been quite good at this financial institution, the nGenius solution's reporting has become an additional facilitator and is increasingly valued by the 300-person development staff. Ready access to packet-level data accelerates both the network and application teams' diagnosis times and provides supporting evidence that can easily be shared.

The application teams also use the nGenius solution to review historical response time data to monitor long-term changes that impact latency of the market feed and multicast applications. In addition, as they roll out several new applications designed to reduce traffic volume on key links, they also plan to employ the nGenius solution to validate those changes. nGenius reports can not only conclusively demonstrate that utilization is down, but also provide evidence to which specific applications contributed to the decrease.

The Bottom Line

Accelerated Diagnosis, Optimized Performance and Improved Collaboration

By strategically deploying continuous packet capture appliances at critical points of the network, this financial institution gained millisecond-level visibility into the end-to-end performance of its critical market trading applications. Back-in-time analysis capabilities improved the operation team's ability to accelerate problem resolution. The nGenius solution's microburst and response time alarming gives the team advanced warning of brewing issues by providing preemptive notification of microburst issues that can have a grave impact on application performance and latency.

In addition, the network and application teams collaborate more efficiently by working from a consistent and common set of metrics and performance views, and both teams use the nGenius solution to optimize the application service delivery environment and plan for changes or capacity issues more efficiently.



Americas East

310 Littleton Road
Westford, MA 01886-4105
Phone: 978-614-4000
Toll Free: 800-357-7666

Americas West

178 E. Tasman Drive
San Jose, CA 95134
Phone: 408-571-5000

Asia Pacific

17F/B
No. 167 Tun Hwa N. Road
Taipei 105, Taiwan
Phone: +886 2 2717 1999

Europe

One Canada Square
29th floor, Canary Wharf
London E14 5DY, United Kingdom
Phone: +44 207 712 1672

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For more information, please visit
www.netscout.com or contact NetScout
at 800-309-4804 or +1 978-614-4000

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