

nGenius Trading Intelligence

Cohesive End-To-End Monitoring and Analysis for High-Frequency Trading Environments

Highlights

- Real Time Trading Intelligence Dashboard
- Addresses the latency management needs of the high-frequency trading market
- Provides transaction correlation processing to deliver hop-by-hop latency visibility across network devices, trade gateways, and smart order routers
- Isolates bottlenecks using comparative trade analysis
- Supports most trading protocols including: FIX, STAMP, OUCH, Eurex, LBM, LLM, TIBCO and custom protocols
- Leverages the widely deployed nGenius® InfiniStream® appliance to collect and analyze trading traffic on a distributed basis

The nGenius® Trading Intelligence is a high-performance, latency-management solution for trading environments that address the specialized visibility needs of exchanges, buy-side and sell-side capital market firms. The solution provides real-time, end-to-end visibility into complex trade order execution, market data feed latency and performance metrics for trading environments. The integrated trade-specific capabilities with progressive real-time multi-hop technologies, provides latency measurement and monitoring, transaction correlation and analysis.

Cohesive Latency Monitoring

Performance and transaction latency are critical success factors to trading outcomes. Trading-focused organizations invest significantly in technology to maintain high uptime and performance levels.

The Real Time Trading Intelligence Dashboard provides visibility into both One Way Latency (OWL) and Round Trip Time (RTT). The dashboard provides clear trading metrics status of user selected trading transaction and market data feeds.

In addition to single order trade transaction statistics, flexible charts and graphs are provided for any combination of performance data, including specific information on hundreds of market data feeds.

Monitoring total transaction latency (either round trip or one way) as a single number is helpful to prove if delays are creeping up or down. However, if one device is responsible for the bulk of a delay, it is time consuming to pinpoint the issue when the transaction crosses multiple devices. More information is required on a hop-by-hop basis.



Figure 1: nGenius Trading Intelligence Real Time Dashboard.

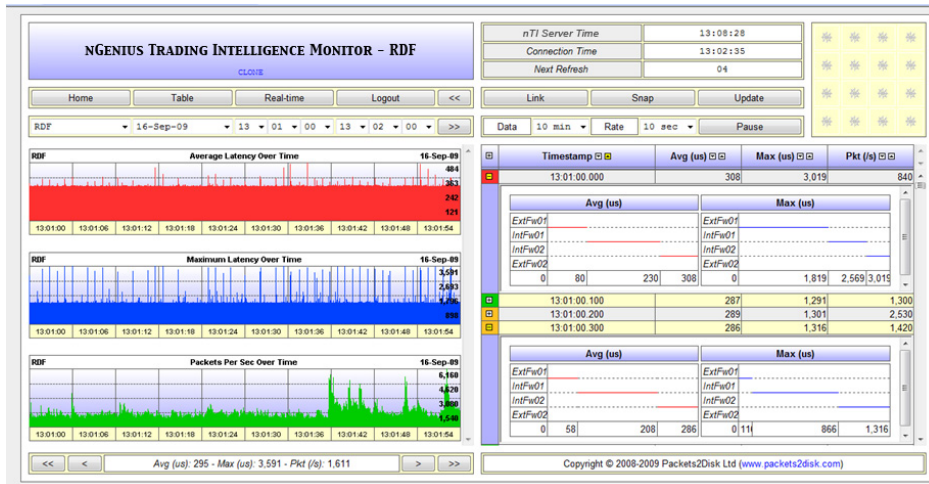


Figure 2: nGenius Trading Intelligence Console

Hop-to-Hop Transaction Stitching

The data flow architecture that supports trading applications is extremely complex. A single transaction can be physically transformed each time it passes through a firewall, gateway or smart order router. Depending on the device, each “hop” can modify addresses, ports, middleware and/or protocols, changing the look of the flow. These flow transformations are difficult to track. From point-to-point the packets may look quite different. With nGenius Trading Intelligence, transaction flow components are stitched together across the network in real-time, providing an end-to-end perspective with latency details on each hop. This processing capability quickly isolates latency issues, drastically saving time and money.

Comparative Trade Analysis

Due to the flexible, multi-dimensional nGenius Trading Intelligence Console interface, it is a snap to compare a broad range of trading components. For example, a smart order router will often split trades among multiple trading venues. If one exchange is seen to respond slower than the others, trades can be rerouted to the other venues until the latency issue is resolved, thus sidestepping a latency bottleneck.

Another example might compare trading stations over the course of a day. If one station consistently trades faster than others, determine what is different. Perhaps it is linked to a faster server or a direct connection that could be replicated? Other analysis might include evaluation of order modify-cancel percentages.

Market Feed Analysis

In addition to the trading transactions, trading firms must monitor the multiple Market Data Feeds (MDF) to support the trading activities. These multicast based feeds provide vital market information in real time.

Both microburst and message lose occurrences can greatly impact the trading strategies and results. To meet this visibility need, nGenius Service Assurance Solution provides 800+ MDF classification and tracking out of box. Both microburst and message lose events can be alarmed instantaneously to the nGenius Server and nGenius Service Delivery Manager.

nGenius Trading Intelligence software perform additional analysis with MDF and provide Real Time Latency update via nTI Dashboard and nTI Latency Monitor.

How It Works

The nGenius Trading Intelligence solution leverages a tiered architecture. This tiered approach (figure 2) collects information from various data points and then combines it into a crisp, consolidated view. The primary components are:

nGenius Trading Intelligence Console

This flexible interface provides cohesive real-time views into the performance of low-latency trading applications. Multi-dimensional filtering provides detailed graphs and charts to track and analyze combinations of stations, trades, venues, and sessions.

nGenius Trading Intelligence Server

As trading records are received from InfiniStream® data sources, the nTI server correlates and creates hop-to-hop metrics. The consolidated trading information is stored on the server's Trading Intelligence data base for use within the interactive nGenius Trading Intelligence console.

nGenius InfiniStream Appliances

Deployed at multiple points of the network where detailed packet analysis and historical back-in-time- analysis is needed. The nGenius InfiniStream® appliances are optimized to passively capture, store and index terabytes of packets quickly and efficiently at line-rate speeds. Trading statistics are gathered and forwarded to the centralized server.

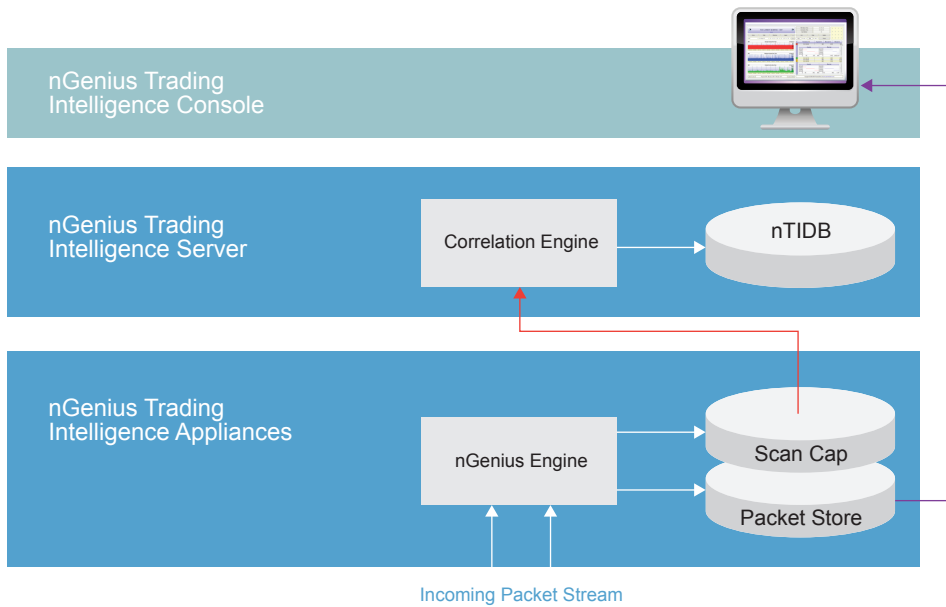


Figure 3: A tiered architecture provides correlation across the trading infrastructure.

Leveraging 25 Years of Passive Packet-Flow Analysis

NetScout® is the market leader in Unified Service Delivery Management enabling comprehensive end-to-end network and application assurance. For 25 years, NetScout has delivered breakthrough packet-flow technology, providing trusted and comprehensive real-time network and application performance intelligence. NetScout solutions are passive and do not interfere with the packets or the associated trades. The financial industry has long been a cornerstone of NetScout business. The widely deployed nGenius and Sniffer® solutions have enabled the IT departments of banks and investment concerns around the globe to predict, preempt and resolve the most difficult network and service delivery issues. In trading venues alone, more than twenty exchanges depend on NetScout products.

Key Features

The nGenius trading Intelligence solution provides:

- Real-time and historic latency information on financial systems data
- Measures one-way (market data) and two-way (trades) latency
- Web-based console interface
- API access to the trading metrics database
- Detailed drilldown of sessions (Exchange or end client) and transactions
- Data available for reporting/compliance

Hardware and Software Requirements

Minimum Console Requirements:

- Operating System: Microsoft® Windows® XP Professional w/ Service 3; Windows 7
- CPU: Intel® dual core 2.4 GHz or higher
- RAM: 2 GB RAM available system memory
- Monitor: VGA color monitor w/ 1280x1024 resolution
- Web Browser using Internet Explorer, Firefox, Safari, or Chrome

nGenius Trading Intelligence Server Requirements:

- Operating System: Microsoft® Windows® Server 2008; Linux RedHat Enterprise License 5.x
- CPU: Intel® Quad Core 2.4 GHz or higher
- RAM: 8 GB
- Storage: 500GB free hard disk space (Based on Trading environment); CD-Rom Drive
- Adapter: Network Adapter Card with 10/100/1000 interface

Data Source Requirements:

- One or more nGenius InfiniStream appliances that support firmware release v4.9 MR1



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NetScout offers sales, support, and services in over 32 countries.

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