

# Electronic trading firm gains ultra-low latency exchange connectivity with Arista

## Highlights

### Challenge

Obtain the lowest possible latency between the exchange connection and trading servers for fast market data receipt and transmission of order entry messages

### Arista Solutions

Arista 7130 devices running the MetaMux application - allowing for data fan and multiplexing in a fraction of the latency of traditional switches\*

### Results

- Faster access to market data
- More precise trade executions
- Reduced exchange connectivity costs
- Ability to make superior trading and investment decisions

The Arista 7130 provides cost-effective access to exchanges at low nanosecond levels - providing the algorithmic asset manager 300 nanoseconds lower latency when sending messages from the trading server to the exchange in comparison to traditional network switches.

This enables the electronic trading firm to gain a competitive edge in providing clients with superior investment decisions, higher execution precision, and excellent ROI.

### Project Background

With a wave of consolidation rocking the high frequency, algorithmic, and quantitative trading space, gaining a competitive edge in this data-driven environment is ever more challenging. Return on investment relies heavily on two contributing factors: 1) the trading and prediction algorithm which analyzes the market data and 2) the speed at which market data is received and investment decisions are fed back to the exchange.

Responding quickly to market events is critically important. Reducing the latency in the network links which connect firms to exchanges is key. A dedicated exchange connection for each server is prohibitively expensive and hard to scale. Using traditional Layer 2 or 3 switches to share a connection introduces significant latencies, ushering in an era where Layer 1+ technology is the preferred solution.

### The Challenge

The electronic trading firm was looking to replace its standard Layer 3 network switches, which were too slow for making and transmitting nanosecond investment decisions with specialist ultra-low latency network equipment.

They were looking for a cost-effective solution using a commercial tried and trusted configuration - a 'plug and play' approach. Key decision criteria included:

1. Faster, more cost-effective exchange connectivity
  - Ultra-low latency market data fan-out in 5 ns
  - Ultra-low latency order aggregation / cross-connect sharing in 45 ns
2. Easy integration with existing infrastructure and technologies
3. Out-of-the-box approach with little to no need for customisation or application- level changes
4. Easy set-up, usability and ease of management

**The Solution**

The infrastructure team at the electronic trading firm performed detailed market research and talked to various Layer 1 technology providers. Arista came highly-recommended and after shortlisting and testing an Arista device as well as another competitive offering, the trader decided to roll out Arista’s 7130 network devices across its co-located trading sites.

It introduced several Arista 7130 low-latency, FPGA-enabled devices running the Arista MetaMux application. The 48-port switches are designed for the most latency-critical networks, such as trading environments, and allow for data fan-out in as little as 5 nanoseconds as well as data aggregation/multiplexing at double-digit nanosecond level (exact aggregation latencies depend on the device series in use – Find all numbers here\*)

The Arista switches are deterministic, with virtually undetectable jitter for Layer 1 links, and can utilise 100% of the available bandwidth.

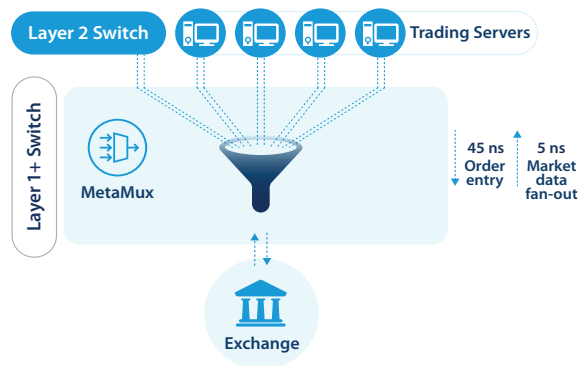
Moreover, they include a host of usability/management features such as:

Device Features:	
Dynamic patching	Precision timestamping for compliance and network monitoring purposes
Media conversion	BGP/PIM support
Ad-hoc tapping without rewiring	Telemetry
Complete packet statistics for all ports	And more ...

**The electronic trading firm decided to use Arista for a number of critical reasons:**

- The lowest latencies on the market: data fan-out at 5 ns and data aggregation at 45 nanosecond level
- Extremely feature-rich devices
- Solid product roadmap and commitment to continuous innovation
- Highly-responsive technical support
- Ability to evaluate the solution in a real environment before making the purchase decision

**Architecture Diagram**



## Conclusion

The trading firm has seen vastly reduced latencies, improving their speed from trading server to exchange by approximately 300 nanoseconds. This resulted in faster order execution and improved investment decisions.

It also leveraged several additional device features such as the ability for 'electronic patching' as well as packet capture to feed its capture solution and enhance its network monitoring capabilities. The electronic trading firm can now...

1. Make better investment decisions and offer its clients higher returns on investment by:
  - Receiving market data in as little as 5 ns
  - Executing trades/placing orders in 45 ns
  - Save up to 300 ns on the fast path from trading server to exchange
2. Reduce exchange connectivity costs, with the ability to share one cross-connect between 46 servers
3. Continuously improve its network through connection monitoring and full packet statistics
4. Reduce time and cost of data centre visits through Arista's "wire once" approach, and the ability of remote patching devices
5. Future-proof its network through Arista's easy integration with third-party technologies and growing partner/solutions network

The FPGA team at Electronic trading firm is now also evaluating the FPGA features of other Arista devices, which will allow trading firms to run its own FPGA logic directly on the Arista platform.

*\* LATENCY FOR MULTIPLEXING: E-SERIES 45 NS, K-SERIES 99 NS*

*\* LATENCY FOR DATA FAN OUT: 5 NS ACROSS ALL DEVICE SERIES*

### Santa Clara—Corporate Headquarters

5453 Great America Parkway,  
Santa Clara, CA 95054

Phone: +1-408-547-5500

Fax: +1-408-538-8920

Email: [info@arista.com](mailto:info@arista.com)

### Ireland—International Headquarters

3130 Atlantic Avenue  
Westpark Business Campus  
Shannon, Co. Clare  
Ireland

### Vancouver—R&D Office

9200 Glenlyon Pkwy, Unit 300  
Burnaby, British Columbia  
Canada V5J 5J8

### San Francisco—R&D and Sales Office 1390

Market Street, Suite 800  
San Francisco, CA 94102

### India—R&D Office

Global Tech Park, Tower A & B, 11th Floor  
Marathahalli Outer Ring Road  
Devarabeesanahalli Village, Varthur Hobli  
Bangalore, India 560103

### Singapore—APAC Administrative Office

9 Temasek Boulevard  
#29-01, Suntec Tower Two  
Singapore 038989

### Nashua—R&D Office

10 Tara Boulevard  
Nashua, NH 03062



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