Enyx product update

Continuing innovation & lowering latency

IT'S NOT WHAT YOU BUILD

IT'S WHAT YOU BUILD NEXT

Our Products

nxAccess
Trade

An end-to-end market access solution that fully processes, filters and normalizes raw market data and can send orders both from a hardware and a software trading algorithm.

nxFeed
Distribute

A full-featured ultra-low latency market data distribution system, which utilizes the power of FPGA technology to offer wire-speed performance and jitter-free determinism.

nxLink
Connect

With fair bandwidth sharing and smart fiber arbitration, our wireless link management product suite is designed to build next generation, low latency trading infrastructure

nxFramework
Develop

Our industry-first development kit for financial institutions to build FPGA-enabled solutions in-house, including pre-trade risk checks, smart order routing, and trading platforms.

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Solution Update

- Full featured FPGA trading engine with algo sandbox
  - Receive **fully normalized** market data including A/B arbitration & **book building** directly into the FPGA algo, leveraging tried & tested nxFeed capabilities
  - **Preload** execution engine with template orders from software - **trigger** & **update** as an atomic action from FPGA simplifying & reducing overall development efforts
  - Host any trading algorithm in an FPGA sandbox for optimal performance
- Designed to host simple & complex strategies
  - **Tick-to-trade** & **tick-to-cancel** strategies listening to market data events to trigger orders
  - **Execution-to-trade** strategies listening to execution reports to update or cancel position
  - **Multi-exchange** strategies updating positions on several exchanges at once
- Quincy Extreme Data **- Available now!**
  - Normalized into Enyx Market Data Protocol (nxMDP) for compatibility with existing deployments
- CME iLink 3.0 **available since June 2020**
  - Backward compatible with iLink 2.0 until official phase out
  - Fully certified with CME

# QED/iLink 3.0 - Latency Context
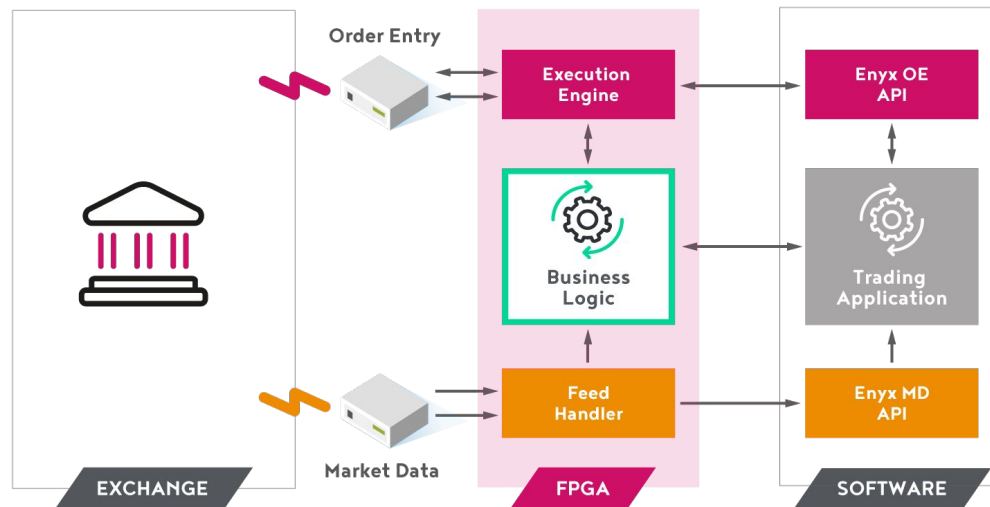
- Latency measured from SOP to SOP time-stamped at the switch before aggregation

- FPGA algorithm reacts to the trade quantity size

    - Can trigger up to 8 orders for a given market data message

    - Each order is sent on a separate TCP session

- Market data protocol is Quincy Extreme Data (QED)

- Orders are 100 Byte iLink 3 orders (170 Byte TCP fragments)

# QED/iLink 3.0 - Latency (Single TCP)*

Latency_nxAccess-QED-to-iLink3_Replay-1x_8-sessions_1-TCP-port_session-breakdown

wire_to_wire Latency Evolution (50)
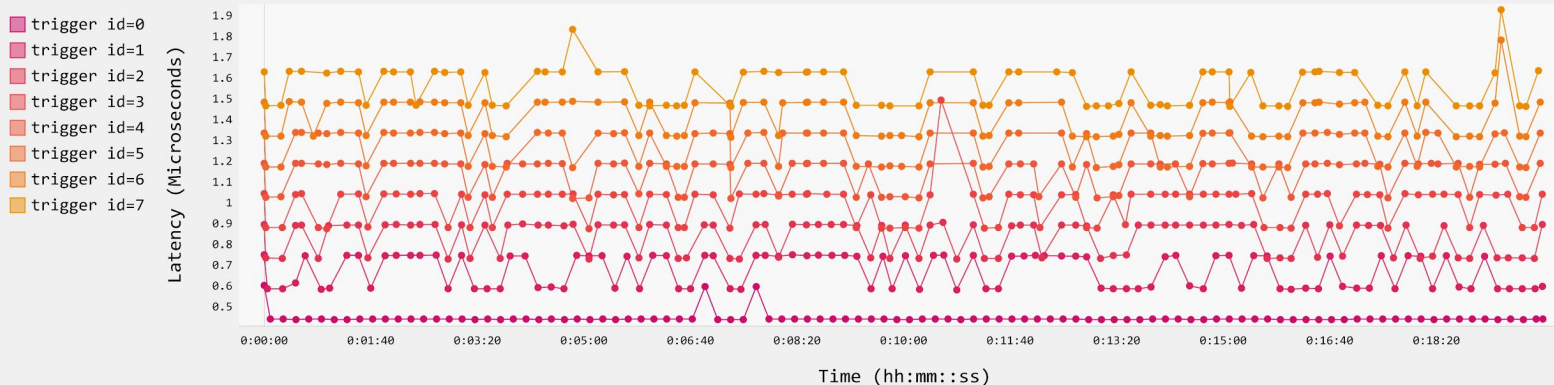
Trigger Id	0	1	2	3	4	5	6	7
50th Percentile	437 ns	591 ns	743 ns	877 ns	1,026 ns	1,169 ns	1,320 ns	1,624 ns

QED/iLink 3.0 - Latency (Dual TCP)*

Latency_nxAccess-QED-to-iLink3_Replay-1x_8-sessions_2-TCP-port_session-breakdown
wire_to_wire Latency Evolution (50)
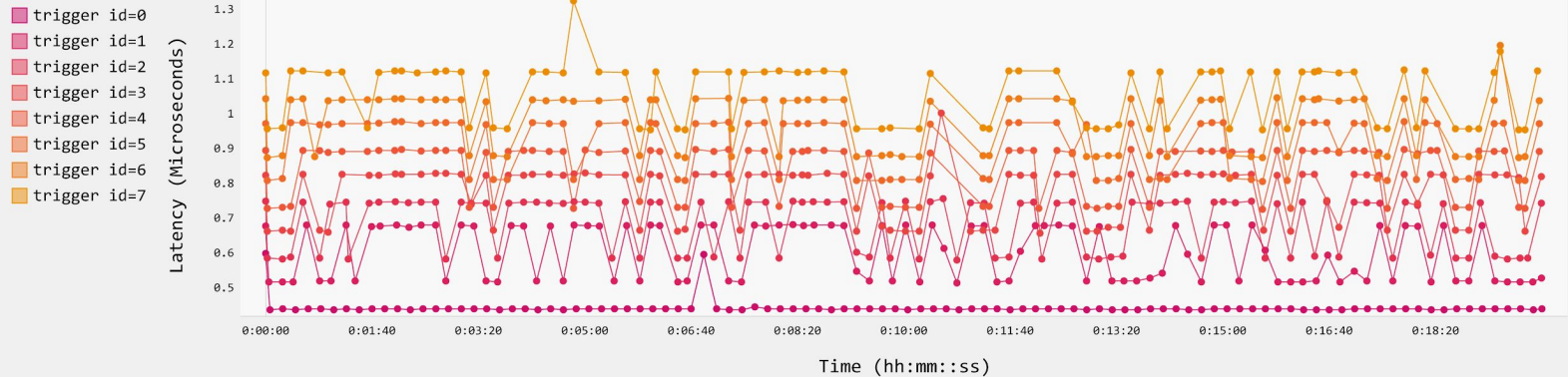
Trigger Id	0	1	2	3	4	5	6	7
50th Percentile	437 ns	517 ns	583 ns	663 ns	729 ns	809 ns	877 ns	957 ns
Improvement	*0.00%*	*12.52%*	*21.53%*	*24.40%*	*28.95%*	*30.80%*	*33.56%*	*41.07%*

* NOT A STAC BENCHMARK

Summary

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- Quincy Extreme Data (QED) market data protocol support
  - **Available now**!

- CME iLink 3.0 execution protocol support
  - **Available now!** (since June)

- 50 percentile latency (SOP to SOP QED UDP to 100 Byte iLink 3.0 TCP fragments):
  - **437 ns** for the first order triggered by a market data event*
  - **41% faster** when using dual 10 Gbs output*

+11,00.00

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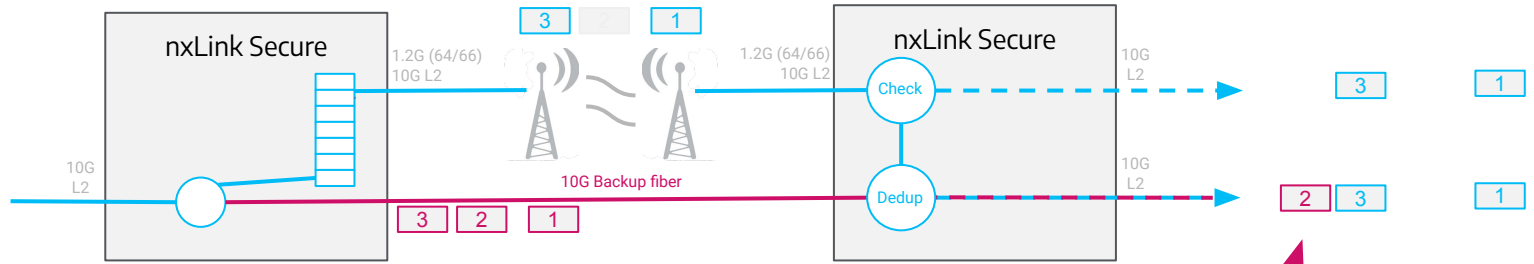
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Secure Version 2 - Reminder

- nxLink Secure version 2 only included 2 outputs:
  - A raw copy of the wireless traffic
  - A de-duplicated output ensuring that packets would all be transmitted without duplicates

- However, when "securing" market data feeds, having UDP packets sent out of order is problematic for existing software or hardware feed handlers

Secure Version 3 - New Features
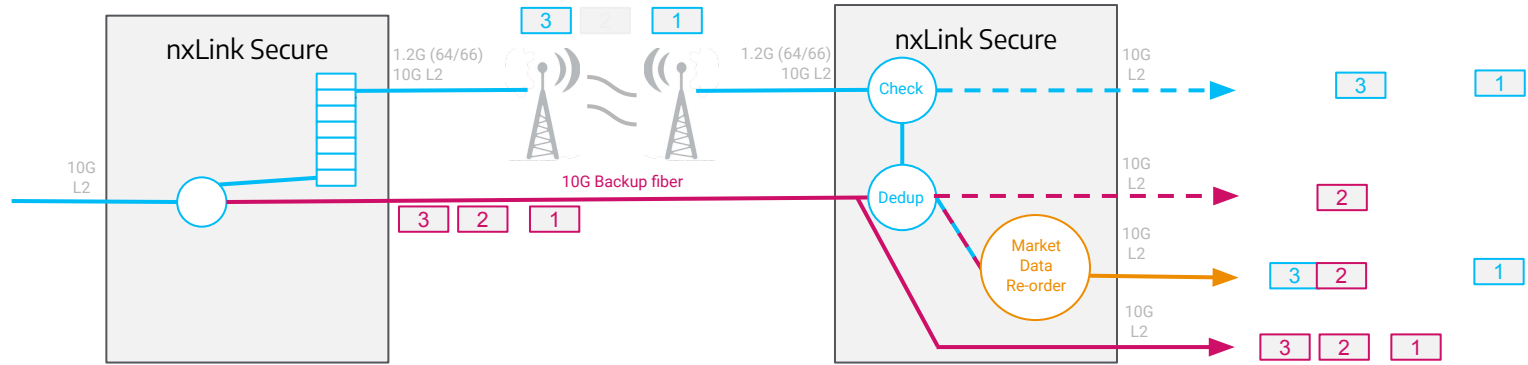
- New output with configurable market data reordering
  - Reordering performed using market data sequence numbers
  - Compatible with all major binary market data protocols

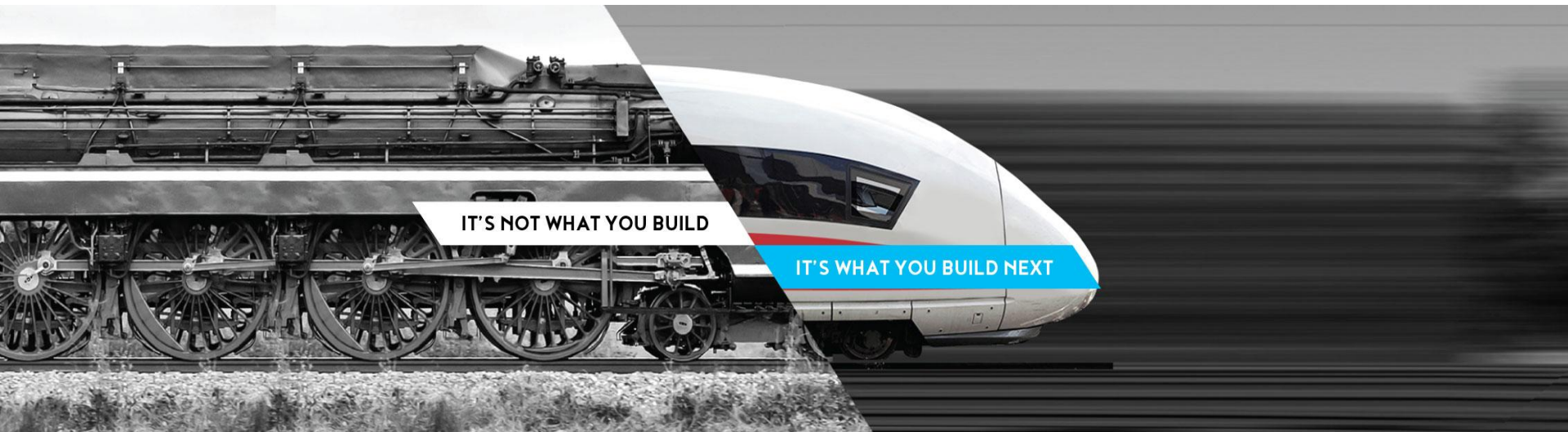- Additional fiber backup copy output allowing for "non-secured" traffic to be sent through the backup fiber
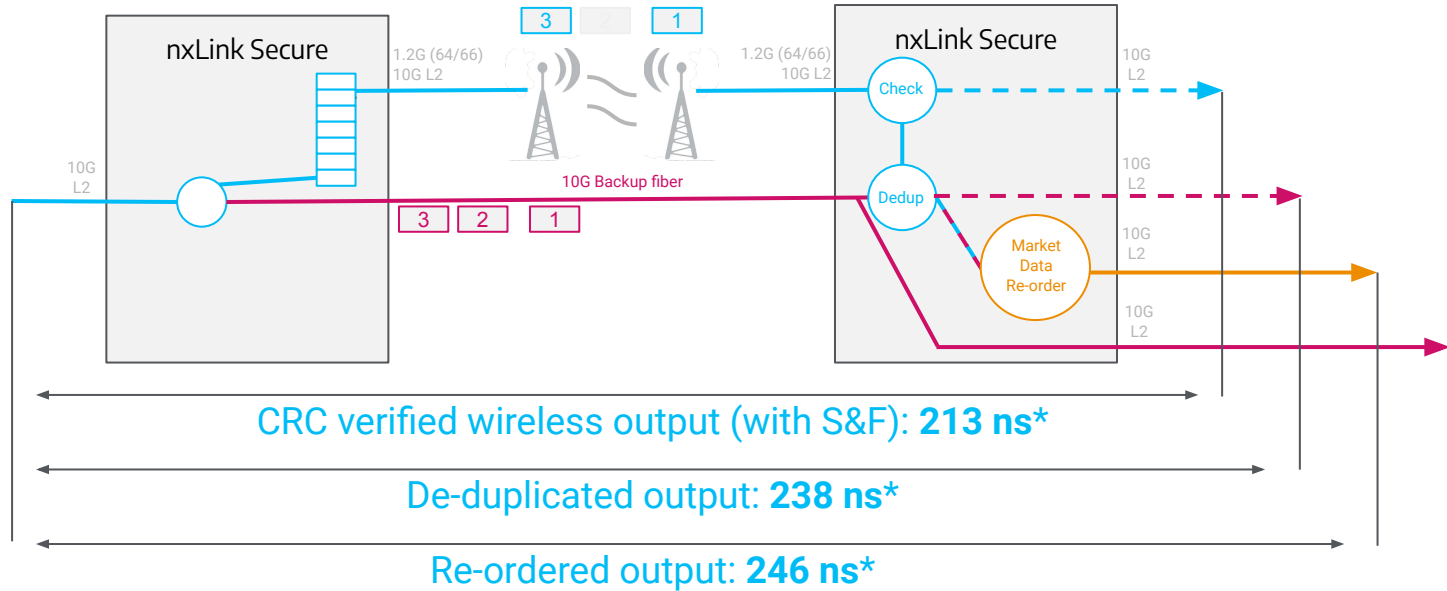
Secure Version 3 - Summary

- **Available now** for existing customers!

- New features

  - Multiple outputs

    - RF only

    - Fiber dedup

    - RF + dedup + reorder

    - Raw fiber

  - Market Data **reordering**

  - **Multicast IP/Port overwrite**

  - Input buffer with **packet expiration timer**

  - Seamless **integration** with nxFeed

- Latency (SOP to SOP one way for a 128 Byte frame)

  - **238 ns for a deduplicated** output*

  - **246 ns** (+8 ns) with **market data reordering***

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