



Product Update

**Tick-to-Trade FPGA Development Platform and
Optimized Output for Wireless Networks**

STAC - Spring Summits 2018

London, Chicago, New York

A pure FPGA Tick-to-Trade Development Platform

Built on two leading ultra-low latency solutions:

- NovaSparks **NovaTick Ticker Plant for Market Data**
 - Fastest feed handler on the market
 - 60+ markets coverage with rich feature-set



- SolarFlare **AOE TCP/IP Solution for Order Execution**

- Provide a smooth transition from software to FPGA for managing order execution through TCP/IP. All latency sensitive functions of TCP are handled in hardware.
- Lightweight solution leaving 90% of the FPGA available for the algorithm.



A pure FPGA Tick-to-Trade Development Platform

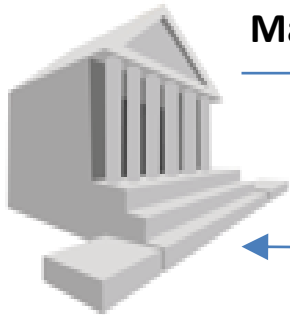


NOVATICK™

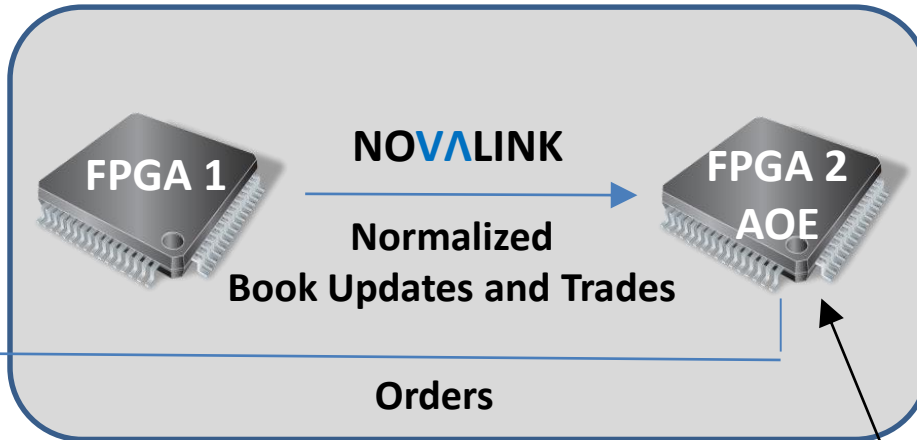
Feed Handler



Trade & Order Execution



Market Data

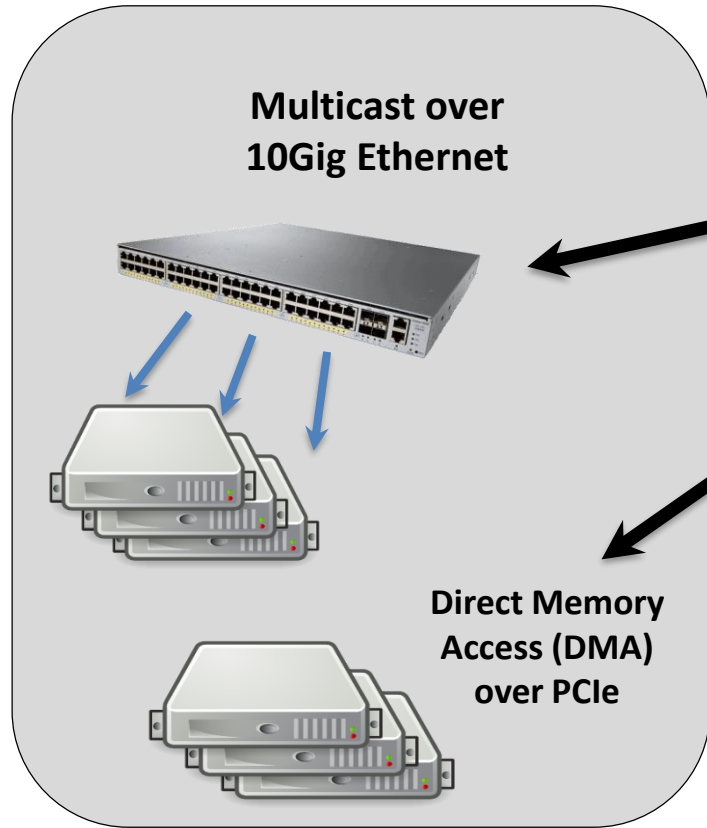


Working reference design
with RTL source code

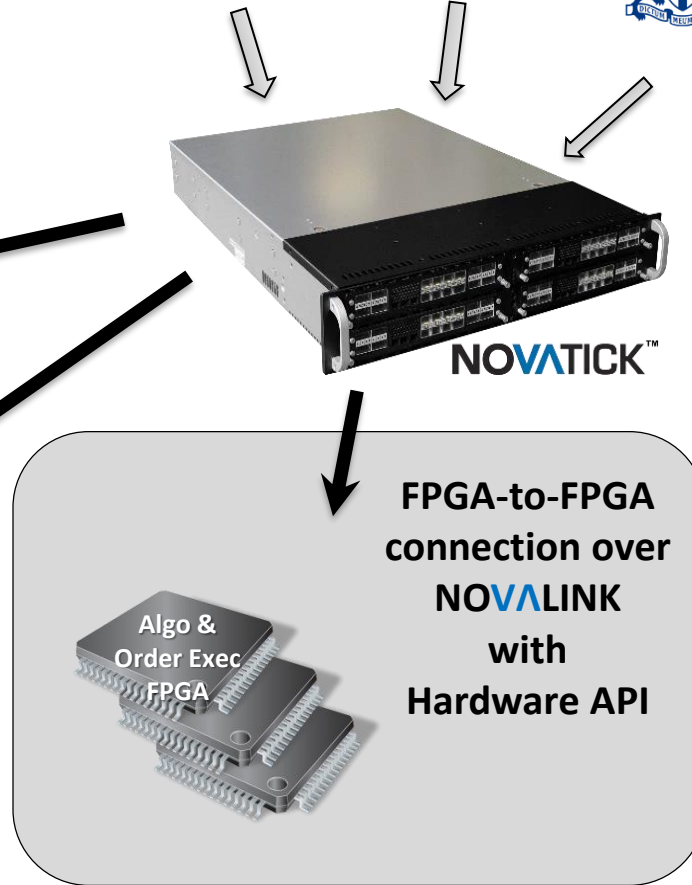
- **Slash time to market**
Access NovaSparks catalog of **60 feeds** through a **normalized** interface. Simplify your design and recompile faster
- **Free up FPGA resources**
90% of the AOE FPGA resources available for trading algos to implement complex strategies and reduce timing closure
- **Contain development risk and cost**
Focus FPGA development resources on the strategy and not on the **development and maintenance** of all the feed-handlers
- **Achieve Ultra-Low Latency***
810ns tick-to-trade measured for NASDAQ ITCH and OUCH, including book building

(*not STAC benchmark)

NovaSparks Optimized Output for Microwave



**SOFTWARE/CPU
Consumption**



**HARDWARE/FPGA
Consumption**

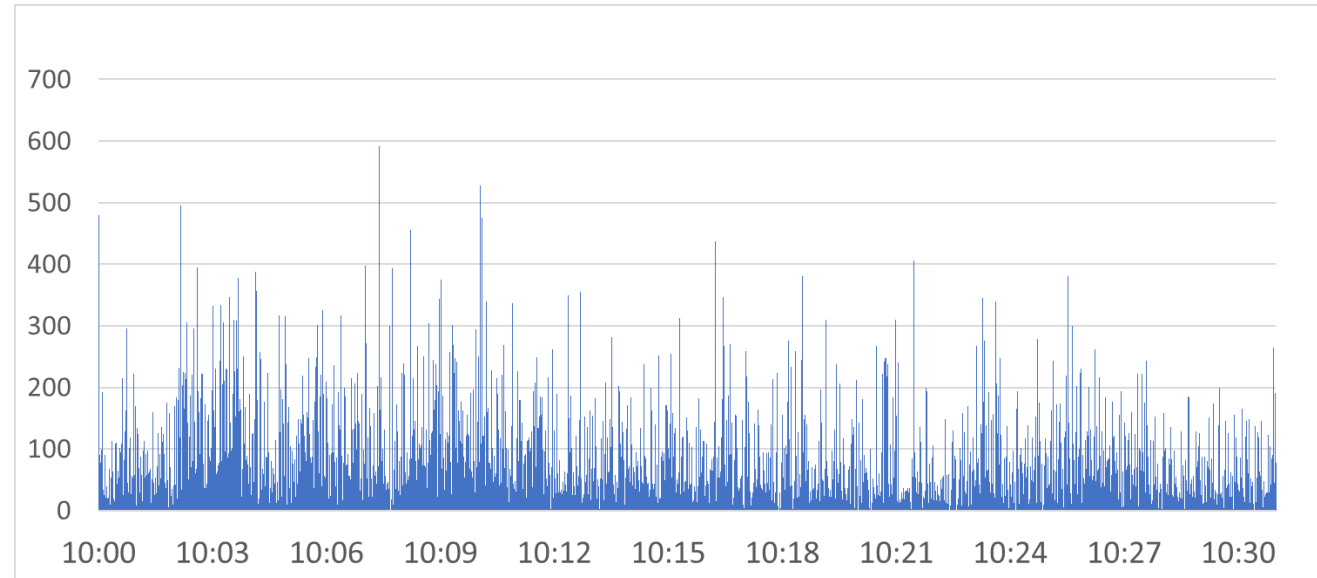
Normalized market data output optimized for small bandwidth



**Wireless Network
Distribution**

NovaSparks Optimized Output for Microwave

- **Pure FPGA** solution for the lowest possible latency
- **Output Shaping** to match the microwave network bandwidth
- **Patent pending automatic book Conflation** during market bursts
- **Configurable** output format
- **Optional Trade Aggregation**
- **Snapshot** publication for built-in protocol resiliency



Number of updates conflated on 30 minutes of Nasdaq ITCH Market Data with 8 symbols and traffic shaping set to 40Mbit/s

THANK YOU...

 Intelligent
Trading
Technology Awards 2018

NovaSparks

Best High Performance
Data Feed Handler - Hardware

WINNER

 Trading
Technology Awards 2017

NovaSparks

WINNER High Performance Data Feed Handler - Hardware



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