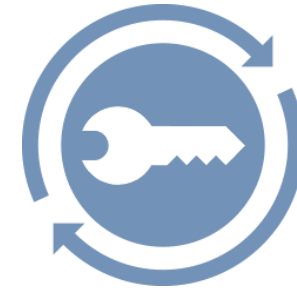# NOVASPARKS

*Pure FPGA Market Data Solutions*

# Introducing NOVALINK

STAC  -  Spring Summits

June 2016

# NOVASPARKS at a Glance

**Pure FPGA Turnkey Solution**

Sub microsecond latency

Highest Determinism
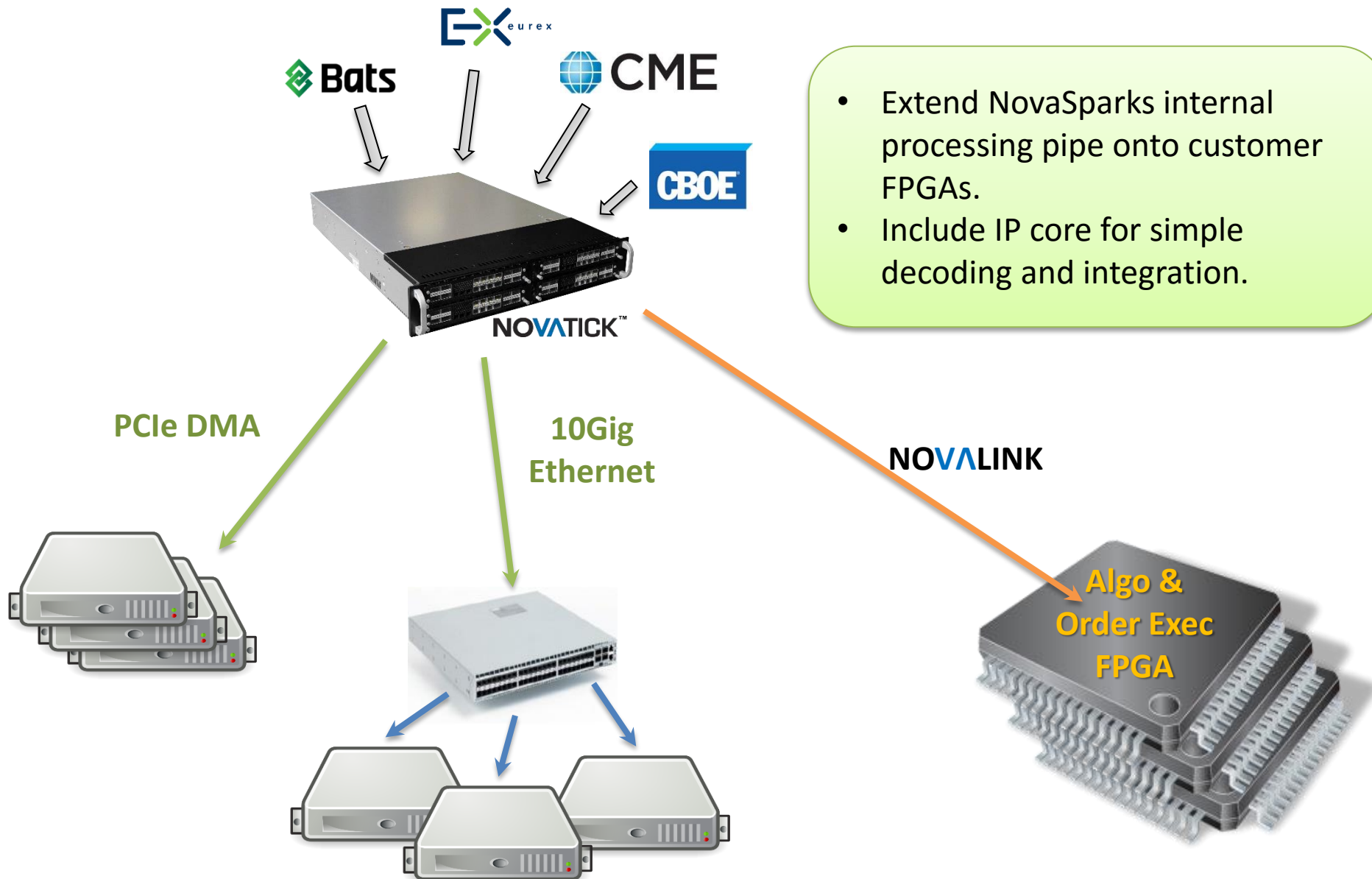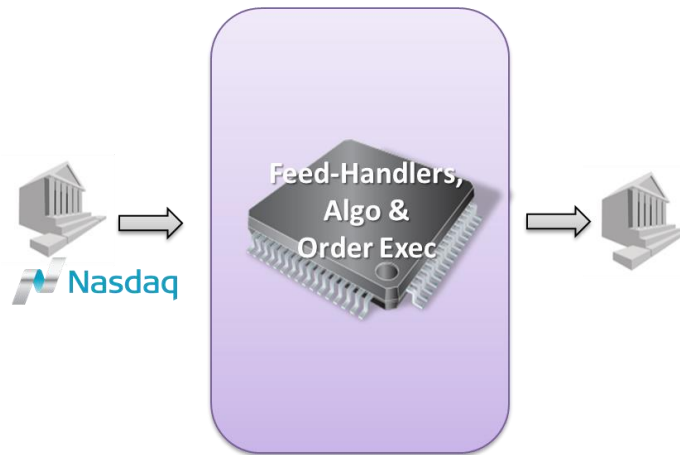
**Appliance Solution**

Easy deployment

Scalability, Fan-out

**Focus on Market Data**

Coverage, Robustness, Feature set

# NOVATICK's Output Options



- Extend NovaSparks internal processing pipe onto customer FPGAs.
- Include IP core for simple decoding and integration.

PCIe DMA

10Gig Ethernet
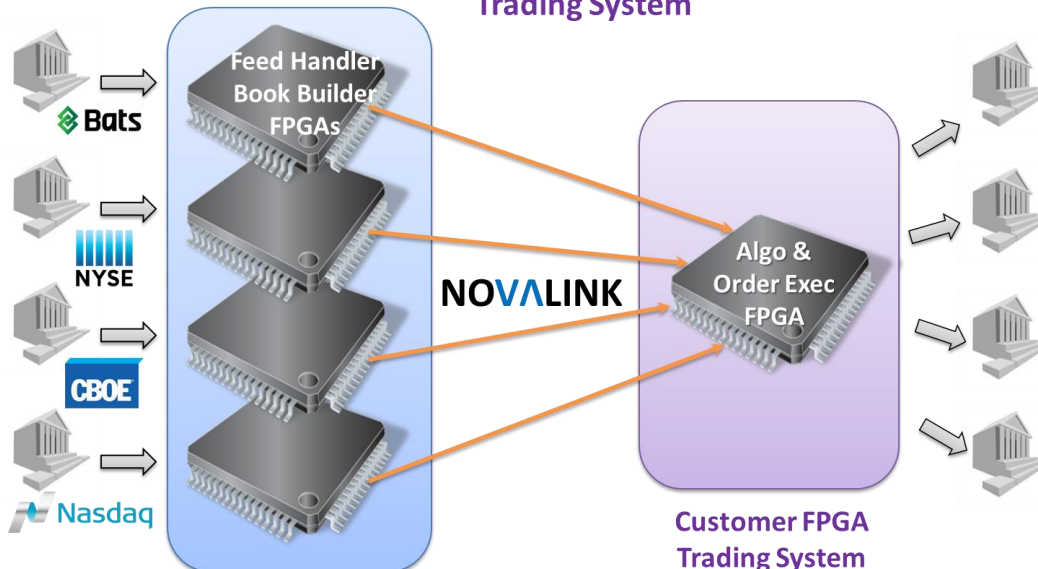
NOVALINK

Algo & Order Exec FPGA

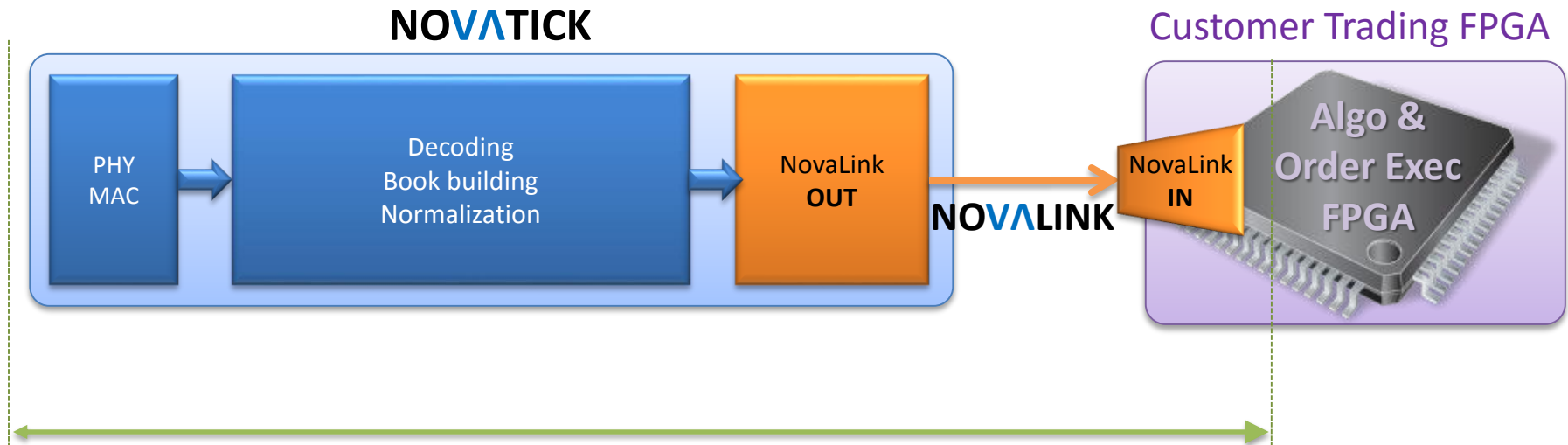# NOVΛLINK: One chip Vs. Multi chip architecture



Customer FPGA
Trading System

Lower Latency, but:

- Limited instrument capacity
- Limited functionality
- Support for simple strategies
- Longer time to market

- Full universe instrument
- Full featured feed-handler
- Support for multiple markets
- Allow for complex strategies
- Faster time to market

NOVΛTICK™
Ticker Plant

Customer FPGA
Trading System

# NOVALINK: End-to-end Latency



**NOVATICK**

Customer Trading FPGA

PHY MAC → Decoding Book building Normalization → NovaLink **OUT**

**NOVALINK**
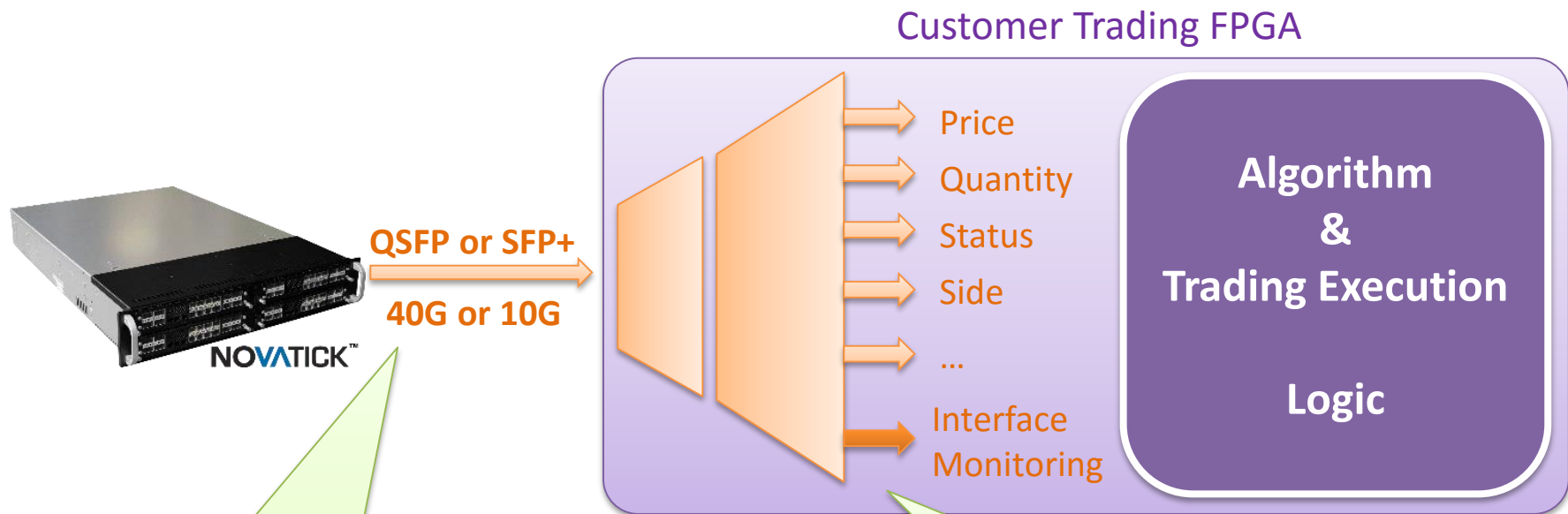
NovaLink **IN** → Algo & Order Exec FPGA

**WIRE-to-FPGA Latency:**

- **1000ns for Order Based Feeds**
  (NASDAQ, ARCA, LSE, EOBI…)

- **750ns for Price Based Feeds**
  (CME, CBOE, EMDI…)

  *Not STAC benchmarks.*

# NOVALINK: Simple and Versatile Integration

NOVASPARKS

Customer Trading FPGA

QSFP or SFP+

40G or 10G

Price

Quantity

Status

Side

…

Interface Monitoring

Algorithm & Trading Execution

Logic

NOVATICK™

**Versatile Connectivity Options:**

- 40Gig QSFP or 10Gig SFP+
- Ethernet or NovaSparks Layer 2
- Altera or Xilinx

*Not all combination available yet.*

**Easy integration**

- "Hardware API" IP Core
- Pre-decoded data fields directly available as a separate bit vector
- Normalized across markets

# Why NOVΛLink?

- **Enable the porting of complex strategies to full FPGA**
  Don't be limited by one-chip anymore. Develop pure FPGA strategies that consume data from **several markets and thousands of instruments** at the same time.

- **Reduce time to market**
  Access NovaSparks catalogue of **40 feeds** through a **normalized** interface. Simplify your design and recompile faster.

- **Contain development risk and cost**
  Focus FPGA development resources on the strategy and not on the **development and maintenance** of all the feed-handlers.

- **Increase robustness with fully featured feed-handler**
  Exchange **Refresh** and **Retransmission** services, advanced A/B arbitration, snapshot…

# *THANK YOU…*



**NOVATICK**™

*Contact: sales@novasparks.com*