

# FPGA Financial Solutions

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# Financial FPGA Acceleration Examples

## High Frequency Trading

- Low Latency
- Deterministic performance
- Parallel packet processing
- Tick to Trade

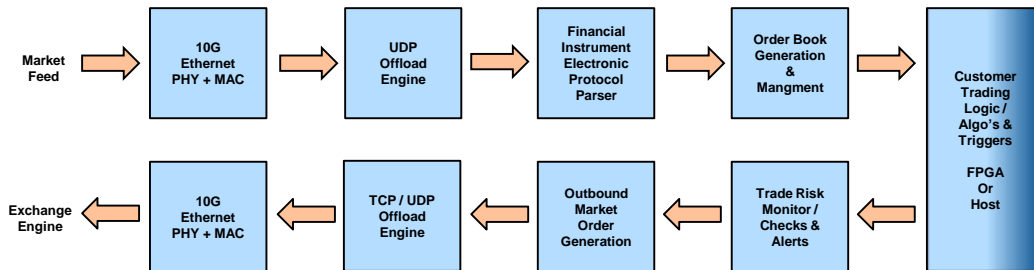
## Risk Monitoring

- Outbound checks on orders and strategies

## NASDAQ

- CPU Offload – e.g. TCP

## Tick to Trade < 1uS



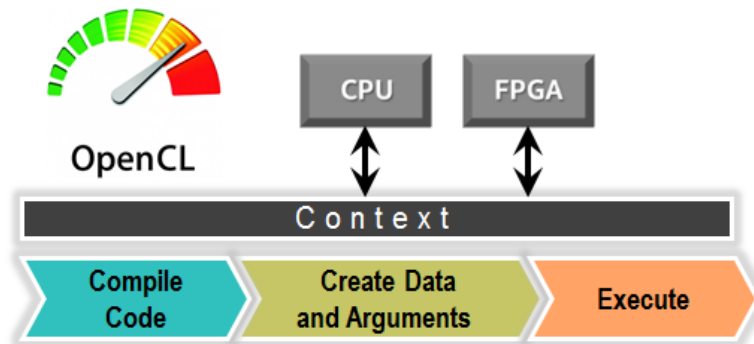
### What is being announced?

On August 1, 2012, NASDAQ OMX® introduced a new NASDAQ TotalView-ITCH equities depth feed offering using field-programmable gate array (FPGA) technology. This offering provides the same industry-leading performance you expect from the NASDAQ OMX ITCH® feeds with the additional benefit of no message queuing during peak market periods. Because FPGA hardware is more efficient at handling high data rates, it offers consistent and reliable service throughout the trading day, even during market peaks.

# Financial Acceleration for Programmers

## OpenCL for Programmers

- Similar model to CUDA but open
- Low-level performance from high-level language
- Optimise precision for task at hand

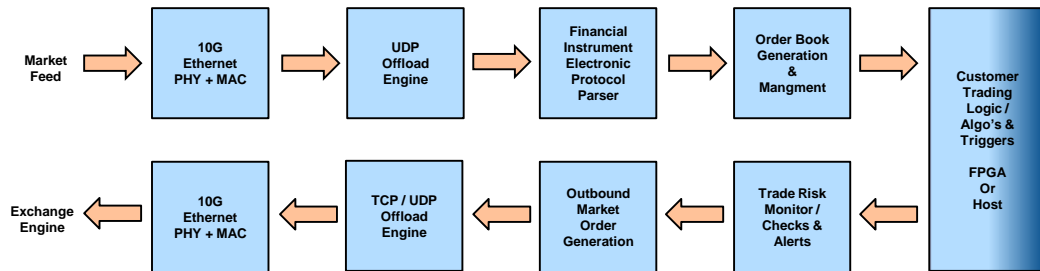


## OpenCL Pipe Extension

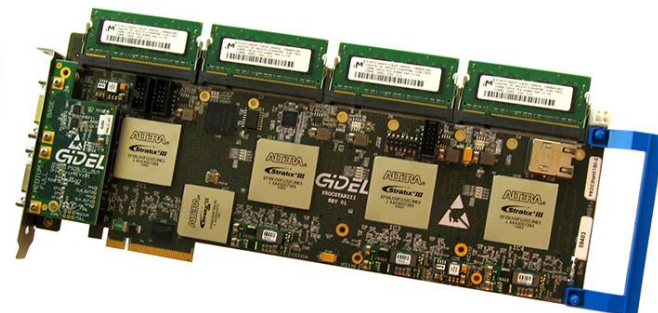
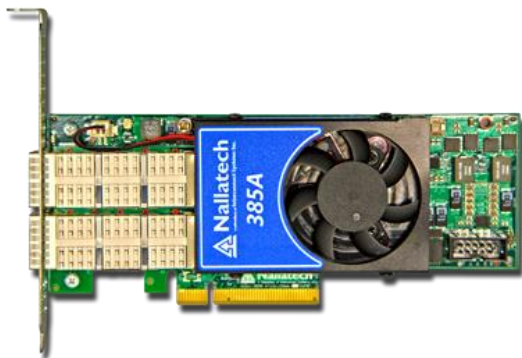
- External IO → OpenCL
- Enables Market Feed Processing

## Tools available today!

- Cyclone V, Stratix V and Arria 10
- BSP support for SOC cards & PCIe cards



# Pictures of available PCIe Boards



# Thank You

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