



NetFPGA SUME

Toward Research Commodity 100Gb/s

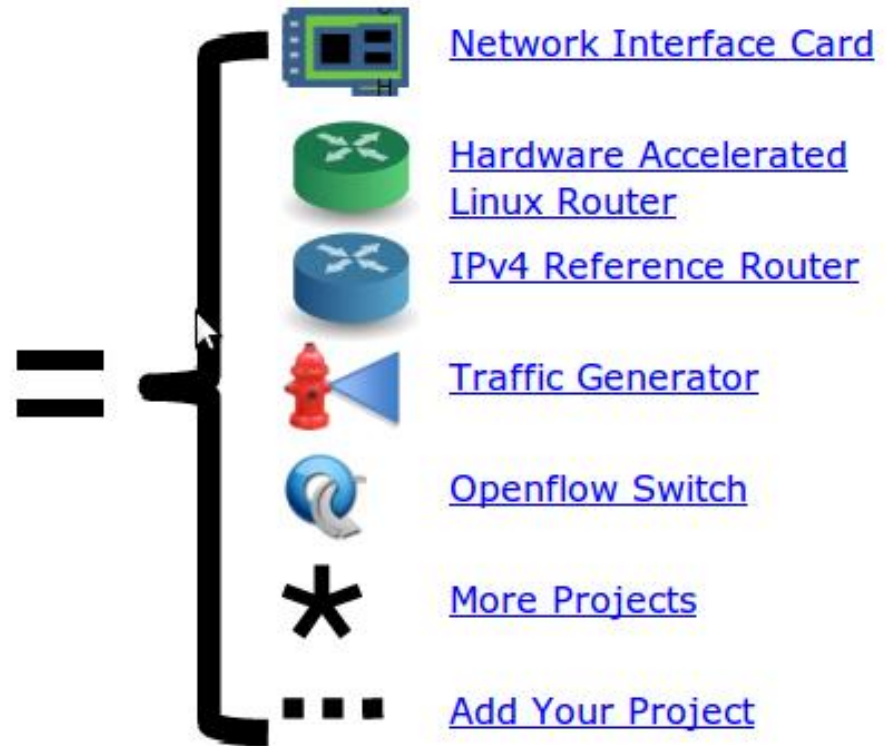
Noa Zilberman, Yury Audzevich and Andrew W. Moore

University of Cambridge

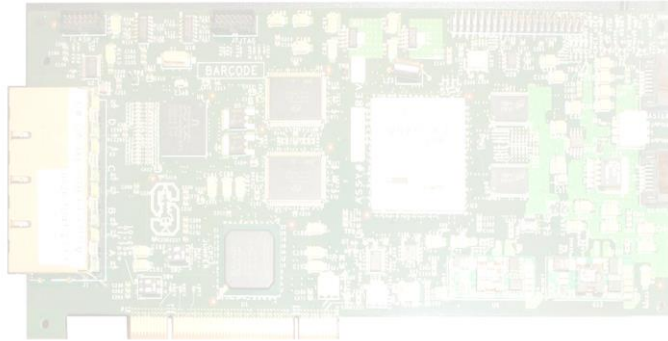
Adam Covington, Stanford University

NetFPGA = Networked FPGA

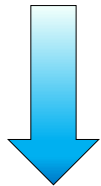
A line-rate, flexible, open networking platform for teaching and research



NetFPGA Family of Boards



NetFPGA-1G (2006)



NetFPGA-1G-CML (2014)



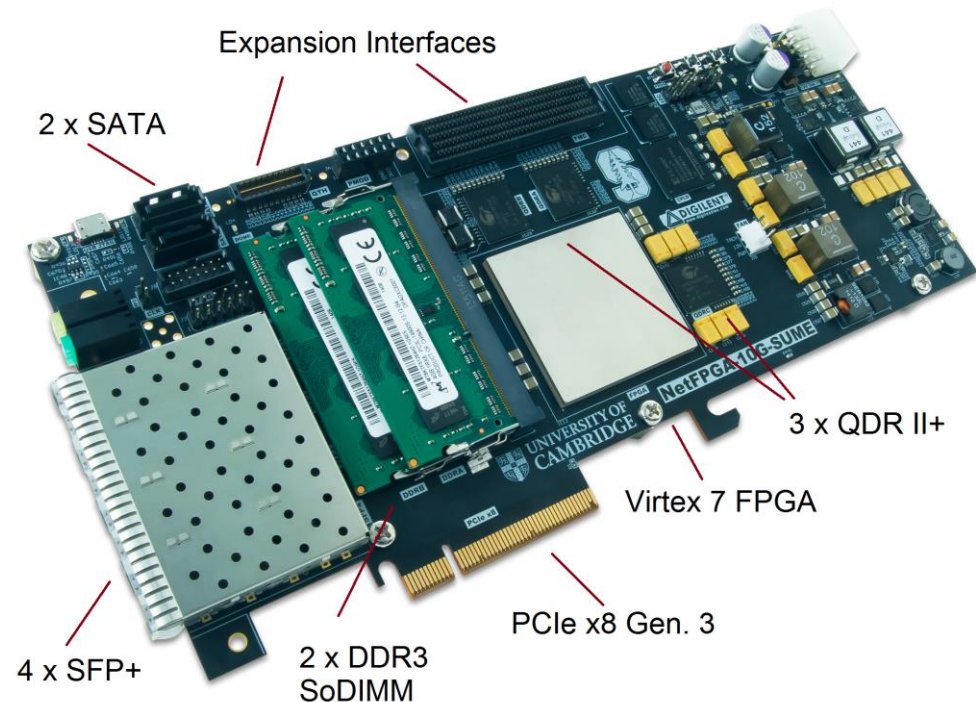
NetFPGA-10G (2010)



NetFPGA SUME (2014)

Introducing NetFPGA SUME

- **FPGA Xilinx Virtex7**
- **4 SFP+ Cages**
- **18x13.1Gb/s Additional Serial Links**
- **PCIe Gen.3 x8**
- **QDR II+-SRAM, 3x72Mb, 500MHz**
- **DDR3 SoDIMM, 2x4GB, 1866MT/s**
- **Expansion Slot**
- **Micro-SD**



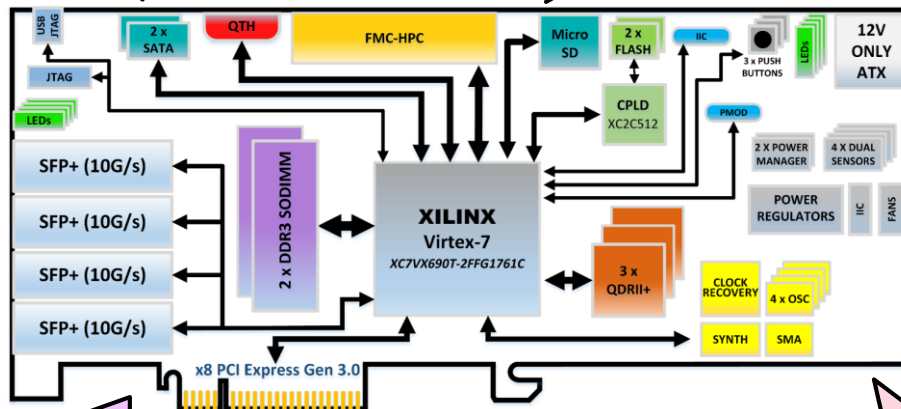
NetFPGA SUME

A Technology Enabler

Stand Alone Device

100Gb/s Switch

PHY & MAC



PCIe Host Interface

Interconnect

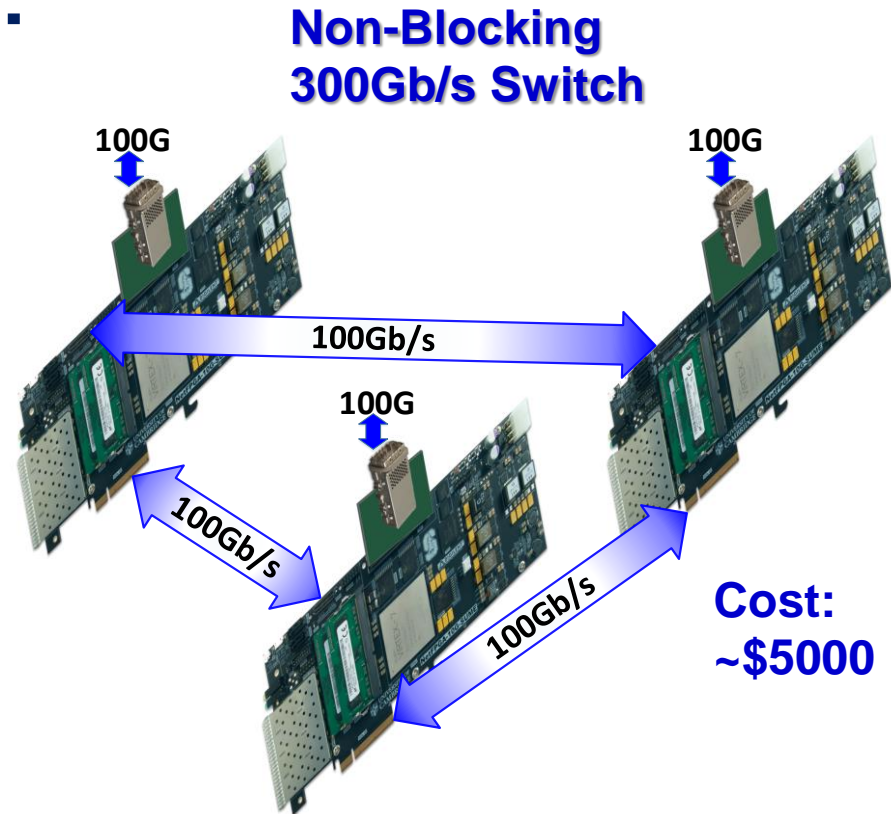
100Gb/s Aggregation

- A development platform that can aggregate 100Gb/s for:

- Operating systems
- Protocols Testing
- Measurements

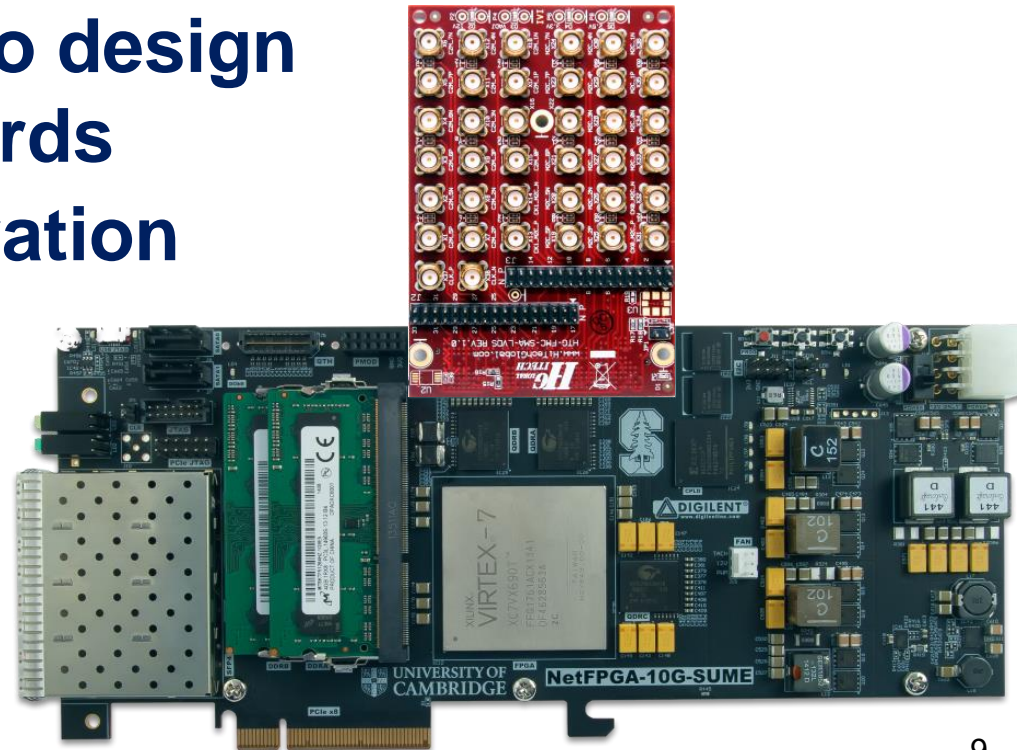
- **NetFPGA SUME can:**

- Aggregate 100Gb/s as Host Bus Adapter
- Be used to create large scale switches



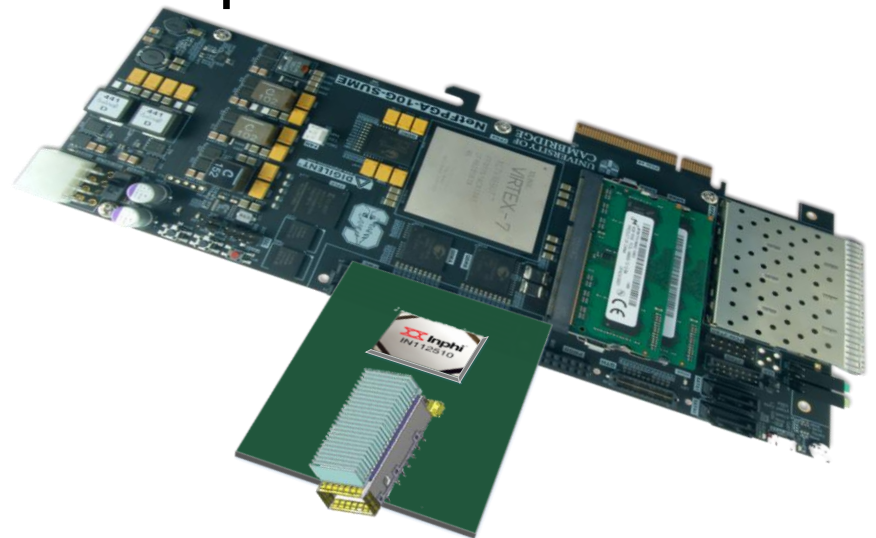
Physical Interface Design

- **A deployment and interoperability test platform**
 - Permits replacement of physical-layer
 - Provides high-speed expansion interfaces with standardised interfaces
- **Allows researchers to design custom daughterboards**
- **Permits closer integration**



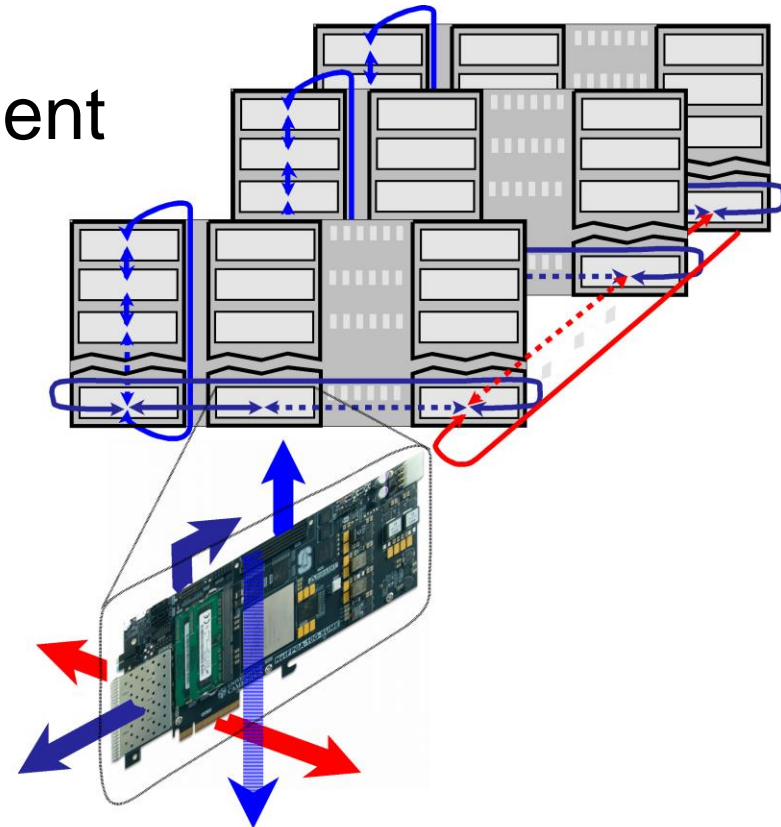
Power Efficient MAC

- **A Platform for 100Gb/s power-saving MAC design (e.g. lights-out MAC)**
- **Porting MAC design to SUME permits:**
 - Power measurements
 - Testing protocol's response
 - Reconsideration of power-saving mechanisms
 - Evaluating suitability for complex architectures and systems



Interconnect

- **Novel Architectures with line-rate performance**
 - A lot of networking equipment
 - Extremely complex
- **NetFPGA SUME allows prototyping a *complete* solution**



N x N xN Hyper-cube

Summary

- **Board is now prototyping, expected to be available H2/14**
- **Part of a large NetFPGA package**
 - Reference projects, drivers, apps, wiki, etc.
- **Want to gain early access? Become a beta tester?**
 - Let me know!

Acknowledgements



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and skills



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