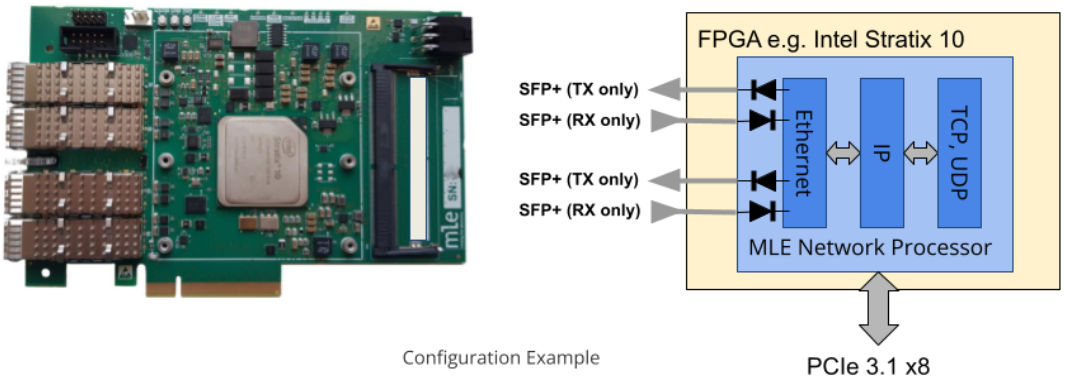
Multi Gigabit Adapters for Data Diodes and Red/Black Network Separation

A Data Diode or unidirectional network bridge or unidirectional security gateway is a piece of hardware used to securely connect two separate networks with the purpose to allow data to travel only in one direction, specifically, from one network into another. Applications are found in high security environments where they connect two or more networks of different security classifications while making it physically impossible to transfer data in the direction from the lower to the higher security classification. **MLE offers Data Diodes for multi-Gigabit Ethernet!**

For this, MLE has partnered with Fraunhofer HHI to provide the industry-proven TCP/UDP/IP Network Protocol Acceleration Platform (NPAP) in form of NPAC, a PCIe Network Protocol Accelerator Card with quad-port 10G Ethernet. NPAC-40G implements reliable high-bandwidth low-latency TCP/UDP/IP transport plus Linux PCIe stream device drivers and can run customizable In-Network Processing such as red/ black network separation functionality on the integrated FPGA subsystem.



Configuration Example

Features and Benefits

FHHL PCIe Card, PCIe 3.1 x8
4x SFP+ for 10 Gig Ethernet

Intel Stratix 10 GX 400 FPGA, hardened

Tx-only and Rx-only (data-diode) network paths disconnect at PCB level or at circuit level

optional TCP/IP Tx-only or Rx-only

optional In-Network Processing for Deep Packet Inspection and/or Firewall

optional access logging

Customizable, Ready-to-Run

Deliverables

Pre-configured PCIe Card, ready-to-run

Linux device drivers (GPL sources)

Application-specific expert design service (optional)

Appliance implementation (optional)

Contact Information

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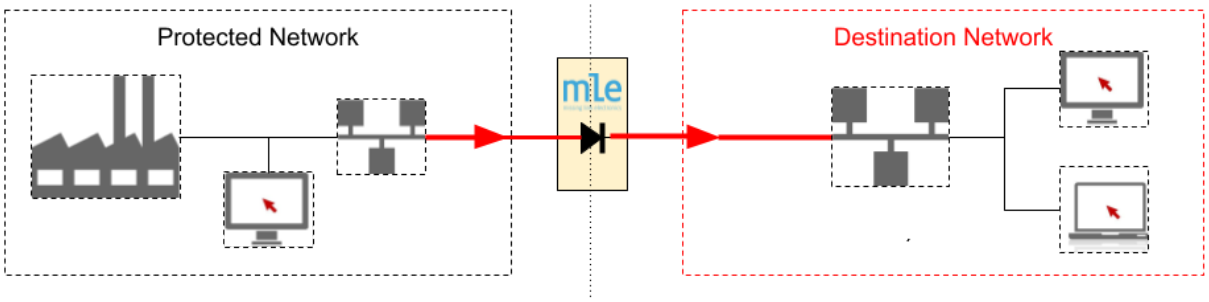
Example Application Use Cases

- Sending status Information from sensitive industrial plants
- Sending video streams from sensitive video equipment / cameras
- Protect classified data in high security networks and prevent it from leaking to low security networks, e.g. in defense



Application Example “System Protection”: Red/ Black Network Separation

Technical Specification

Form Factor, Dimensions	PCI-SIG CEM Rev 3.0 FHHL, 111.15 mm x 167.65mm
Network Interfaces/ Bus Interface	4x SFP+ (10 GigE each) / PCI Express Gen 3. 8 Lanes
On-Board Memory	FPGA-attached DDR4 DRAM via SO-DIMM
Network Function Support	IETF 1122 TCP/UDP/IP plus Linux 4.18 and 5.10
Processor	FPGA based MLE Network Processor (no software)
Hardware Acceleration	IP, TCP, UDP
Protocol Support	customizable, default: IPv4, TCP, UDP,
Throughput	10 Gbps Rx-only / Tx-only (single stream or dual stream/ bidirectional support)
Timestamp	optional, +/- 2 us
Ordering Information	NPAC-10G-DD or NPAC-20G-DD

Missing Link Electronics (MLE)

Our mission is: If It Is Packets, We Make It Go Faster!

Over the last decade we have become experts in accelerating software-rich system stacks via offloading CPUs using so-called Domain-Specific Architectures for computing. To implement this we make heavy use of heterogenous processing devices such as FPGAs which we program using C++/C/SystemC as well as VHDL and Verilog HDL. We have demonstrated to deliver cost-efficient FPGA solutions and, thereby, have become an industry-trusted source of technical expertise in IP Core integration, FPGA acceleration and system realization.

We are a Silicon Valley based technology company with offices in Germany. We are partner to leading electronic device and solution providers and have been enabling key innovators in the automotive, defense, industrial, medical, test & measurement markets with FPGA-based subsystems and systems.