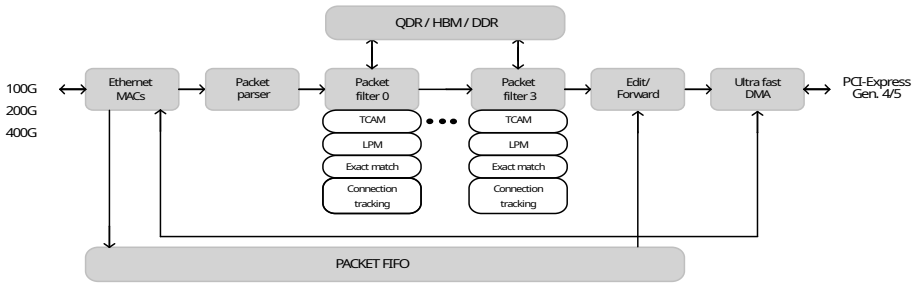
Complete FPGA-based SmartNIC solution

on XpressSX AGI-FH400G hardware from

SmartNIC (Smart Network Interface Card – NIC) is a specialized network adapter that **offloads certain processing tasks** from the host CPU to the NIC itself. These tasks can include **packet filtering, encryption/decryption, compression**, and other functions that are typically performed by software running on the host. By moving these tasks to the SmartNIC, it reduces the load on the host CPU, **increases network performance and significantly improves overall efficiency.** The **FPGA allows for flexibility** in terms of the specific tasks that can be performed, as well as the **ability to easily update or modify the SmartNIC's functionality** as needed.

How DYNANIC makes complete solution on XpressSX AGI-FH400G?

Programming FPGA is not an easy task. DYNANIC **comes with the universal high-speed FPGA packet processing pipeline** for XpressSX AGI-FH400G. This pipeline consists of components required for various packet processing in many use-cases. And so DYNANIC **enables full utilization of FPGA-technology without prior FPGA knowledge!**



This wire-speed capable FPGA pipeline is **controlled from the host software** by standardized and open-source RTE Flow DPDK API. For example, to set up the filtration rule in the pipeline, it is only needed to write **a few lines of code in C++ or Python** programming language. So simple!

Use-cases with DYNANIC

Network acceleration

Examples of processing tasks that can be offloaded with DYNANIC include packet processing, encryption/decryption, compression/decompression or implementation and acceleration of future network protocols.

Network security

Example applications are firewall, intrusion detection and prevention systems (IDS/IPS), and DDoS mitigation (Anti-DDoS). All these can be offloaded with DYNANIC for improving performance and reducing latency.

Network monitoring and analyses

Troubleshooting network issues, detecting anomalies, and identifying performance bottlenecks with full wire-speed traffic capture in real time is possible thanks to DYNANIC.

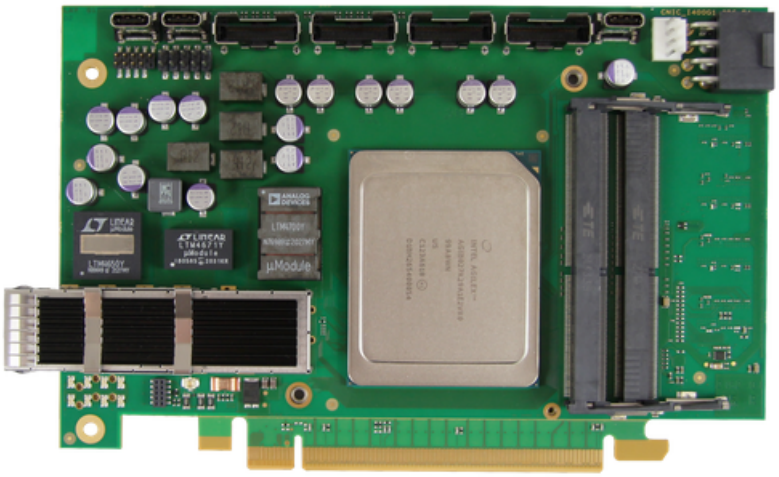
Content delivery

DYNANIC can help applications for accelerating content caching and delivery, improving user experience and reducing server load in content delivery networks (CDNs).

Virtualized networking

Virtualized networking functions (NFV) such as virtual switches and routers improve performance and reduce latency using DYNANIC solution.

And many more . . .



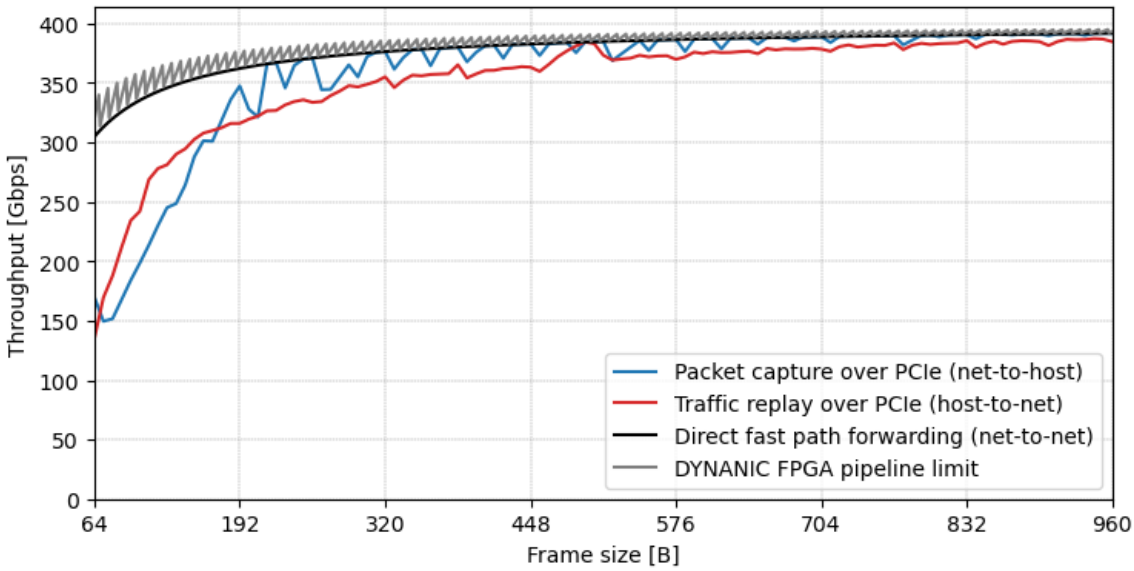
XpressSX AGI-FH400G** by **reflex ces.

Unique features of DYNANIC solution on XpressSX AGI-FH400G

- **No need for FPGA** development, processing pipeline is given
- **Standardized and open-source** DPDK software stack
- **Processing pipeline controlled** by standard RTE Flow interface
- **Full 100 Gbps throughput** to and from host RAM
- **Configurable packet** parser supporting protocols from L2 to L4
- **Different filtering options utilizing** internal or external memories
- **Flow tracking** with fast atomic insert/removal from host
- **Solution ready** for different link speeds even on given card
- **Lossless traffic** processing at wire-speeds from 100G to 400G.

Link speed configuration	Exact match	LPM prefixes	TCAM rules
100 Gbps	1.5 M	1 M	10 k
200 Gbps	1.5 M	1 M	5 k
400 Gbps	0.75 M	0.5 M	3 k

*Achievable rule capacity for different filter types on **XpressSX AGI-FH400G**. Values provided for IPv4 address matching. Exact match and LPM can be combined by sharing the capacity.*



*DYNANIC throughput measurements on **XpressSX AGI-FH400G** with 400GbE and PCIe gen5. On-chip pipeline is calibrated for sustained wire-speed processing with a small margin on top. The only performance bottlenecks are introduced by the overhead of DPDK transfers over PCIe.*

DynaNIC Semiconductors Ltd. offers custom design and development services for FPGA-based projects. For more than 20 years are company team members specializing in the acceleration of algorithms required for high-speed network packet processing (e.g. packet parsing, packet/headers fields extraction, hash based pattern matching, filtering, traffic flow management, etc.) with link speeds up to 400 Gbps. Unique portfolio of IPs was also utilized to bring FPGA technology closer to any software company. That's how the flagship **DYNANIC** solution was created.

reflex ces has been designing and manufacturing high-speed boards and rugged system solutions based on high-density FPGAs and processors since 2000. As a result, the company has vast experience in leading-edge FPGA technology, and is always at the forefront of the market and trends. That is why it was one of the first to come to the market with an high-end FPGA card **XpressSX AGI-FH400G** with a 400 Gbps network interface and PCI Express generation 5.

How to start?

Contact reflex ces to obtain XpressSX AGI-FH400G at their website

and visit

DynaNIC website to download working package for XpressSX AGI-FH400G.