Agilio® LX 2x40GbE SmartNIC

## SMARTNIC FOR HIGH-PERFORMANCE CLOUD,SDN AND NFV NETWORKING

Commercial off-the-shelf (COTS) servers are increasingly used as service nodes for networking and security processing, but often need acceleration to support intelligent applications at high data rates across millions of flows. Netronome's Agilio LX SmartNICs deliver high performance server-based networking functions such as load balancing and virtual switching and can be deployed in standard x86 servers for service node applications in the data center.

The Agilio LX family of SmartNICs are specifically designed for virtualized and non-virtualized x86 server-based service nodes and WAN Gateways. With a unique architectural approach tightly coupling Netronome flow processing cores with general-purpose multicore x86 processors over a high-speed virtualized PCIe datapath, the solution delivers significant scale and efficiencies for networking functions such as security (e.g., IDS/IPS, NGFW, DDoS), load balancing and gateway applications.

Netronome SmartNICs provide a platform to accelerate virtual switching tasks by offloading the entire Open vSwitch (OVS) datapath, eliminating CPU resource constraints, increasing throughput (Mpps) and bandwidth (Gb/s) allowing highly virtualized servers to scale within the data center. Other valuable offloads include L2/L3 switching and routing, packet classification and filtering, NAPT, tunnel handling, intelligent load balancing and cryptography. By offloading these compute-intensive networking functions, performance can be significantly improved.

Based on Netronome's NFP-6000 flow processor, the dual port 40GbE SmartNIC incorporates two PCIe Gen3x8 interfaces, 8GB of DDR3 memory, and 96 highly threaded flow processing cores. Along with Netronome Agilio software, SmartNICs enable application acceleration with standards-based APIs and SDN configuration protocols delivering unmatched host bandwidth to standard single-, dual- and quad-socket servers optimizing NUMA architectures. The solution enables x86-based COTS servers to deliver application performance and scale at levels previously possible only with custom, proprietary and expensive designs.

Netronome SmartNICs provide a 10X performance increase over traditional NICs for server-based networking applications running on x86-based service nodes. Additional hardware accelerators are provided for cryptography, time stamping and SR-IOV. Large on-chip and on-board memories deliver 8M flow table entries and 128k wildcard rules to satisfy the requirements of the most demanding SDN and
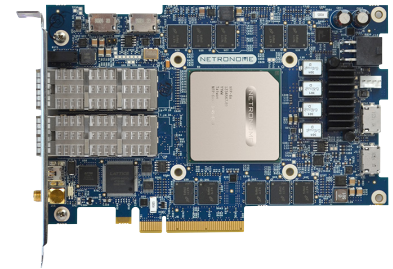
HIGHLIGHTS

- vSwitch datapath offload on popular OS platforms
- SR-IOV, DPDK, zero-copy, packet-direct and stateless offloads
- Server-based SDN with stateless and stateful flow processing
- Comprehensive network acceleration technologies
- Industry-leading intelligent data plane architecture
- Fully programmable control for new network feature rollouts
- Flexible and scalable tunneling and match-action policies

NFV applications. The Agilio LX SmartNIC family provides line-rate programmable packet and flow processing to keep pace with the rapid change in SDN protocols and standards..

SPECIFICATIONS

Interfaces	2-port 40GbE, QSFP
Memory	8GB of DDR3 DRAM @1866 Mhz w/ ECC
Processor	NFP-6480 Processor Operating at 1.2GHz
PCIe Interfaces	(2) Gen 3x8
Operating Systems*	Red Hat Enterprise Linux (RHEL), CentOS, Ubuntu
Hypervisors*	Linux KVM
Ethernet	IEEE Std 802.3ba 40 Gigabit Ethernet
	IEEE Std 802.3ad Link Aggregation and Failover
	IEEE Std 802.1Q.1p VLAN tags and priority
	Jumbo frame support (9.6KB)
	Configuration and diagnostic tools
PCI Express Interface	PCIe Base 3.0-compliant
	1.1- and 2.0-compatible 2.5, 5.0 or 8.0GT/s link rate x8
	MSI-X vector per RX/TX queue pair
	Interrupt coalescing
	PCIe mapped LAN, UART
Connectivity	Interoperable with 10GbE switches
	QSFP to SFP+ connectivity through breakout cable

Please ask your Netronome representative for the latest supported O/S and Hypervisors.

ENVIRONMENTAL REQUIREMENTS

Operating Temp.	5 to 50°C
Storage Temp.	-10 to 60°C
Relative Humidity	5% to 95%, non-condensing
Air Flow	400 lfm min (passive heat sink), 0 lfm min (active heat sink)

AGENCY APPROVALS

Certification	NRTL, FCC, EU, RoHS, CE

Agilio LX 2x40GbE SmartNIC Block Diagram
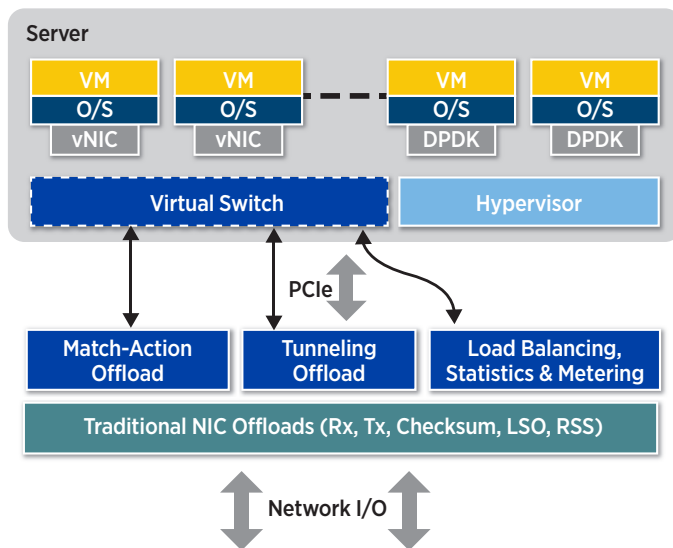
FEATURES

Virtual Switch Data plane Offload

- VXLAN, NVGRE, MPLS, tunnel encapsulation and de-encapsulation
- Programmable support for custom tunnel types
- Flexible packet parsing
- Flexible exact match-action policy offloads
- Flexible wild card match policy offloads
- Hardware-based flow cache for cut-through acceleration
- Stateless and stateful load balancing
- Per-flow metering and QoS

Network Acceleration and Offloads

- TCP/UDP/IP stateless offload
- Receive-side scaling (RSS)
- Single-Root IOV (SR-IOV)
- Multiple queues per virtual machine
- DPDK, zero-copy, kernel bypass, packet direct

Acceleration of Compute-intensive Functions

- Bulk cryptography & sophisticated hashing
- Deep packet inspection (DPI)
- Atomic operations
- Per-flow real-time statistics

Other Features

- Up to 8M flows on card
- Up to 500k tunnels
- P4 and C-programmable for fast feature rollouts

NETRONOME

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