

# Agilio<sup>®</sup> FX 2x10GbE SmartNIC

## HIGH-PERFORMANCE CONTROL PLANE AND DATA PLANE OFFLOAD FOR BARE METAL CLOUD AND DATA CENTER APPLICATIONS

The Agilio FX 10GbE SmartNIC represents Netronome's smartest network adapter to date. It combines the company's flagship, packet-optimized Network Flow Processor (NFP) with a quad-core, general purpose Arm v8 to deliver unprecedented performance with the flexibility to meet any server and network scalability challenge.

### FULL CONTROL PLANE AND DATA PLANE OFFLOAD

Server virtualization brought with it the need for virtual switching within the hypervisor. Offload and acceleration soon followed to reclaim performance lost from traversing the many additional software layers, but network and server management complexity still remains tightly coupled.

Complete control plane and data plane offload bypasses the hypervisor or operating system network stacks to offer line rate networking performance directly to VMs and containers and separates network management from server operation. The Arm processor runs a standard Linux distribution hosting an Open Virtual Switch (OVS) or Data Plane Development Kit (DPDK) control plane while pushing complex network policy to the flow processor for pure speed.

Bare metal server providers can enforce network policies while enabling users to maintain server network control.

### NETWORK SECURITY OFFLOAD

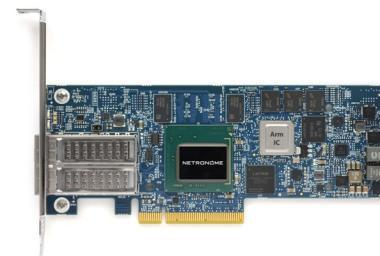
Effective DDoS protection means stopping packets before they reach the host CPU and before they cause an interrupt storm. With the extended Berkeley Packet Filter (eBPF), just-in-time compiled for the NFP and managed by the Arm, offending packets never reach the host, virtual machine or container.

Deep packet inspection (DPI) of non-encrypted and SSL encrypted traffic without impacting host services brings assurance that the network is operating as intended and host services are protected.

Many such complex security offload scenarios are implemented per VM or container using familiar programming models and tools.

### EFFECTIVE LOAD BALANCING

Implement bonding for source load balancing and receive traffic distribution to multiple queues bound without the need for host intervention.



### HIGHLIGHTS

- Includes NFP-4000 with 60 flow processing cores
- Quad-core Arm v8
- Full control plane and data plane offload
- Flexible and scalable tunneling and match/action policies
- Comprehensive network acceleration technologies
- Programmable control for new network feature roll outs

### APPLICATIONS

- Cloud IaaS/PaaS/ Bare metal
- Zero impact network traffic visibility
- DDoS mitigation
- Dynamic security policy implementation with eBPF and XDP offload
- Load balancing
- Network functions virtualization (NFV)
- Network telemetry



SPECIFICATIONS	
Processors	NFP-4000, quad-core Arm v8 Cortex-A72 CPU
Interfaces	2-port 10GbE, SFP+
Memory	4GB total on-board memory - 2GB DDR3 on NFP - 2GB DDR4 on Arm v8
Operating Systems	Red Hat Enterprise Linux (RHEL), CentOS, Ubuntu
Hypervisors	Linux KVM
Ethernet	PCIe Gen3 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	IEEE Std 802.3ae 10 Gigabit Ethernet IEEE Std 802.3by 25 Gigabit Ethernet IEEE Std 802.3ad Link aggregation and failover IEEE Std 802.1Q.ip VLAN tags and priority IEEE P802.1Qaz D0.2 ETS Jumbo frame support (9.6KB) Configuration and diagnostic tools

ENVIRONMENTAL REQUIREMENTS	
Operating Temp.	0-55%
Storage Temp.	-40-70°C
Relative Humidity	5% to 85% non-condensing
Air Flow	350LFM (min)

AGENCY APPROVALS	
Certification	UL, FCC, EU, RoHS, CE

**ORDERING**  
Contact sales@netronome.com for more information

**FEATURES**

- Up to 2M flows on card
- Up to 500K tunnels
- eBPF, C and P4 programmable for fast feature roll outs

**Network Acceleration and Offloads**

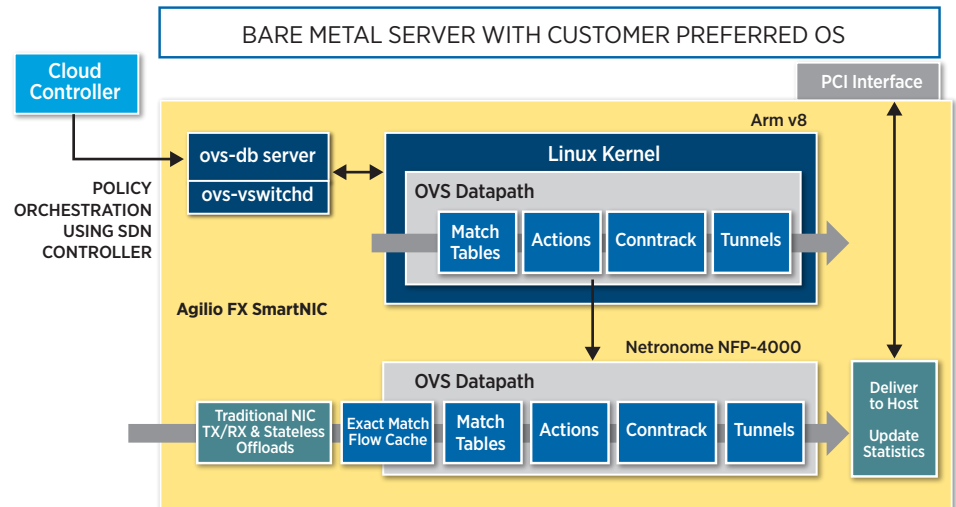
- TCP/UDP/IP stateless offload
- Receive-side scaling (RSS)
- OVS-TC and BPF-based kernel data plane offload, DPDK

**Acceleration of Compute Intensive Functions**

- DPI
- Atomic operations
- Per-flow real-time statistics

**Virtual Switch Data Plane Offload (With Agilio OVS Software)**

- VXLAN, MPLS tunnel encapsulation and decapsulation
- Programmable for custom tunnel types
- Flexible match/action and wildcard policy offloads
- Per-flow metering and QoS



Bare Metal Server Implementation with Agilio FX SmartNIC

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