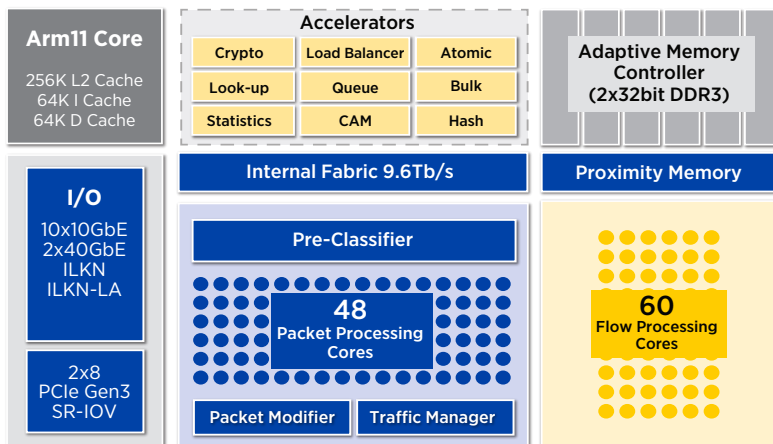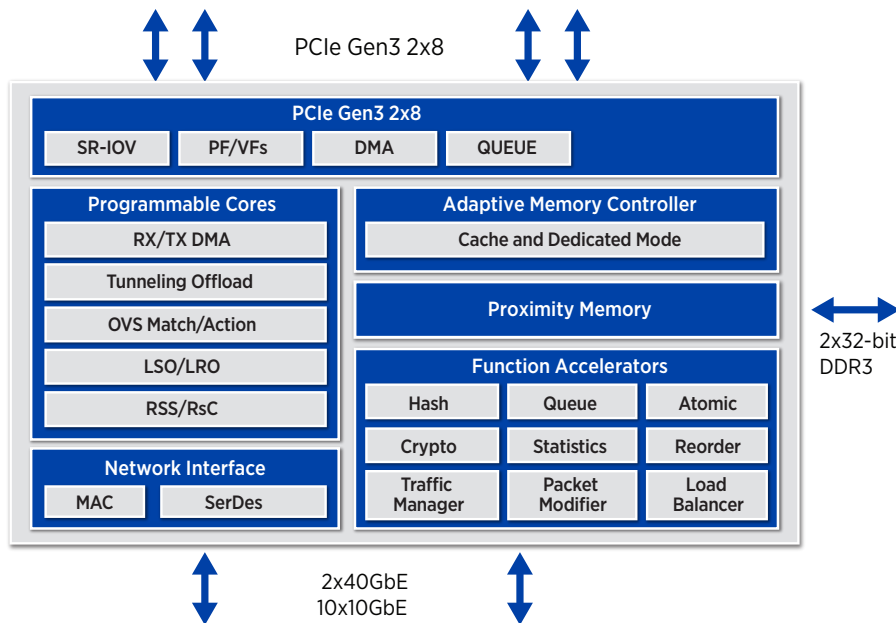# NETRONOME

Netronome NFP-4000 Flow Processor

PURPOSE-BUILT PROCESSORS FOR INTELLIGENT NETWORKING

Netronome's 6th generation NFP-4000 multi-threaded, multicore flow processor targets intelligent data plane processing at higher performance, with lowest power and cost, while enabling the capability to adapt quickly to new networking features. The optimized match/action-based flow processing architecture enables per tenant, per VM, per application policies at scale to support microsegmentation. In security applications, the built-in, high-performance bulk cryptography acceleration delivers secure data access at cloud scale.
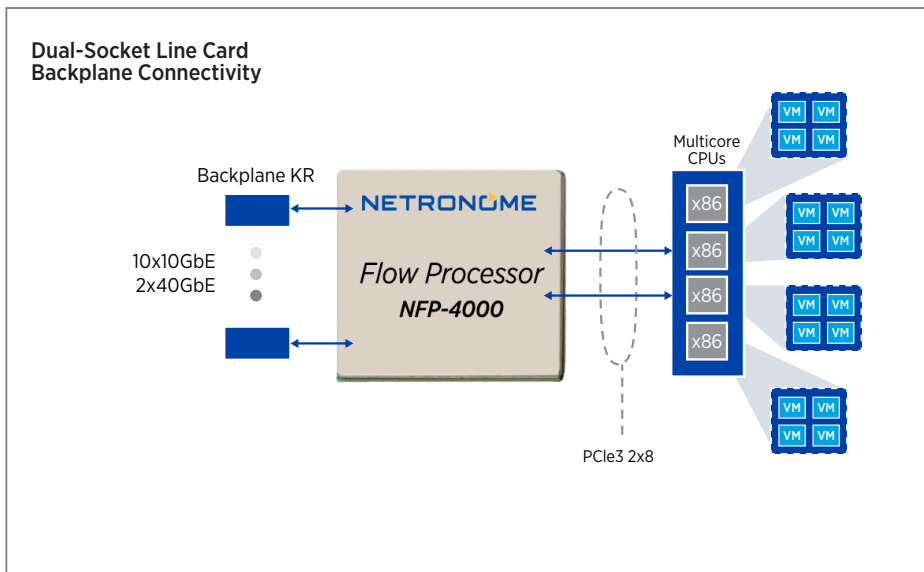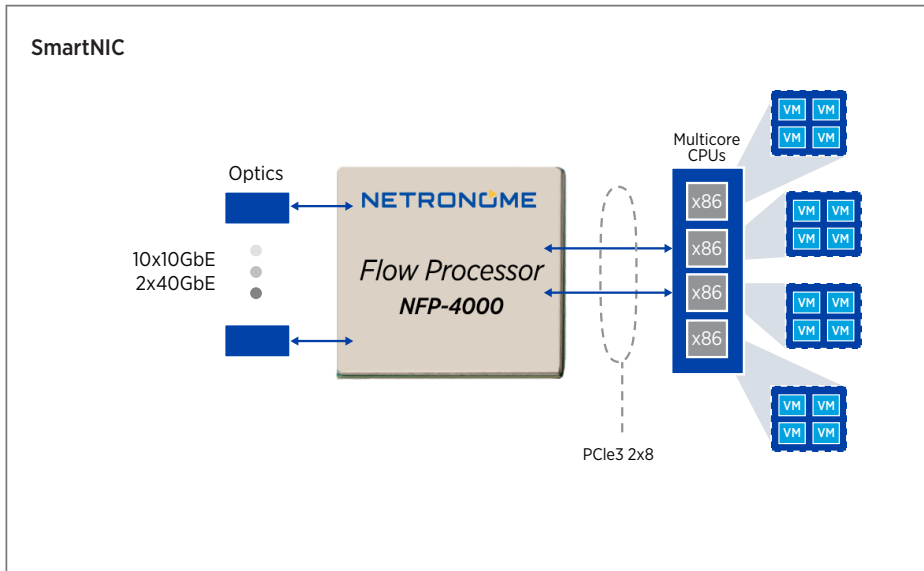
FEATURES

- 60 programmable flow processing cores
- 48 packet processing cores
- PCIe Gen3 2x8 interface (2PF/64VF each)
- SR-IOV with 256 hardware queues
- Adaptive buffer management
- Configurable 2x32-bit or 1x64-bit ECC protected DDR3-1866
- Over 19MB of on-chip memory
- 10 KR capable SerDes supporting:
  - Ethernet - 10Gb/40Gb/100Gb
  - Interlaken - up to 100Gb
- Hardware-based, in-line bulk cryptography support for all major cypher suites
- 60+ dedicated accelerators for Deep Packet Inspection (DPI)
- Traffic management, security processing and bulk cryptography
- Arm11 Core (L1 (64K), L2 (256K))

NFP-4000 Flow Processor Block Diagram

Sample Designs

SmartNIC

Optics

Multicore CPUs

10x10GbE
2x40GbE

NETRONOME

Flow Processor
NFP-4000

x86
x86
x86
x86

VM VM
VM VM

VM VM
VM VM

VM VM
VM VM

VM VM
VM VM

PCIe3 2x8

Dual-Socket Line Card
Backplane Connectivity

Backplane KR

Multicore CPUs

10x10GbE
2x40GbE

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Flow Processor
NFP-4000

x86
x86
x86
x86

VM VM
VM VM

VM VM
VM VM

VM VM
VM VM

VM VM
VM VM

PCIe3 2x8

Benefits

- Fully programmable 100Gb/s L2-L7 processor
- 148 million packets per second
- 100Gb/s wire-speed stateful flow and packet processing
- Support for custom tunnel types: VXLAN, NVGRE, MPLS
- Millions of exact match and wild card flows
- Stateless and stateful load balancing
- Hardware flow tracking for cut-through acceleration
- 100K+ tunnel encapsulation and de-encapsulation

Target Applications

- Security appliances
- Intrusion Detection Systems (IDS)
- Intrusion Prevention Systems (IPS)
- Next Generation Firewall (NGFW)
- Routers
- Load balancers
- Packet brokers
- Data center applications
- Carrier SDN and NFV appliances
- Advanced services blades
- Data center virtualized appliances
- Open Compute Platforms
- Test and measurement equipment
- Network probes and monitors
- Aerospace and automotive
- Industrial control

Software Support

- SDK
- Drivers up-streamed to RHEL
- P4
- BPF, eBPF offload
- Open vSwitch (OVS 2.0) acceleration and offload
- SDN Support
- OpenFlow 1.3 support with 42 match fields
- KVM hypervisor support
- Intel DPDK poll mode driver and zero-copy to Linux user space
- Profile and performance tools

Specifications

- 6/6 RoHS compliant

Package

- 1,020 Ball (33x33mm) Flip Chip BGA, 1mm solder ball pitch

NETRONOME

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