

# NETRONOME NETWORK FLOW PROCESSING PLATFORM



- Netronome Flow Engine (NFE-3240)
- Modular Front-facing I/O Network Modules
- Netronome Flow Management Software
- Netronome Flow Driver



## Accelerate Network and Security Applications to 200 Gbps

Offering the most complex packet and flow processing with unparalleled performance, Netronome's network flow processing solution tightly couples modular I/O, L2-L4 packet processing, L4-L7 flow processing via Netronome's Network Flow Engine (NFE) PCIe cards, and the performance and scalability of general-purpose multicore x86 systems. This heterogeneous multicore architecture sets a new performance benchmark for network appliances with three layers of workload-specific packet, flow, security and application processing, each with increasing levels of granularity.

Powered by Netronome's NFP-3240 network flow processors, the Intel Xeon 5600-based servers deliver up to 200 Gbps of programmable L2-L7 networking in compact 1U and 2U form factors. These high-performance platforms are purpose-built for network and security applications that require line-rate throughput, low latency and high availability.

### Interface Flexibility

To account for the wide variety of required interface options, Netronome has separated the physical interfaces from the packet processing and acceleration hardware. Netronome's pluggable network modules (netmods) offer the most flexible interface options in industry for 1 GbE, 10 GbE and 40 GbE with and without integrated bypass for inline applications.

### Packet Processing and Load Balancing at 240/480 Gbps

Netronome's solution offers L2-L4 packet processing with thousands of rules via an Ethernet switch fabric. Packets are classified on ingress and optionally filtered, cut-through to another network interface, or load-balanced across Netronome's NFE PCIe hardware.

### Network Flow Acceleration

Offering the most complex packet and flow processing, Netronome's NFE scales to 20 Gbps of packet and flow processing per PCIe card. This architecture utilizes the networking-optimized NFE for switching and routing, packet classification, stateful flow analysis, deep packet inspection (DPI), flow-based load balancing and security processing.

### x86 Performance and Scalability

The NFE is tightly coupled with general-purpose multicore x86 systems over a high-speed, virtualized PCIe datapath via SR-IOV. This allows appliance vendors to maintain industry-leading performance by utilizing the latest generation of multicore x86 processors for application and control plane processing.

### Appliance Clustering

To further scale packet, flow and application processing, multiple network appliances can be clustered through a bi-directional 20 Gbps uplink module. Traffic can be balanced across an arbitrary number of devices to offer additional application acceleration for extremely high throughput and compute-intensive workloads.

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*Netronome's network flow processing solution offers the industry's most flexible and highest-performance platform for networking and security applications. With four tiers of packet, flow and application processing, developers can offer over 100 Gbps of throughput in a compact 1U/2U form factor. Netronome's solution combines pluggable 1 GbE, 10 GbE and 40 GbE network modules and Netronome's NFE cards over a high-speed virtualized PCIe datapath with the performance and ubiquity of general-purpose multicore x86 systems.*

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For more information about other Netronome products, please visit [netronome.com](http://netronome.com).



## Features and Benefits

### High Performance

- Couples Xeon 5600 processors with Netronome's NFE acceleration cards, providing a platform offering 20x the performance of standard x86 systems
- 40 microengine cores operating at 1.4 GHz, providing over 1,800 instructions/packet at 30M pps
- Improved application/server performance:
  - Significantly reduce host CPU utilization by offloading flow processing to the NFE
  - Strategically place or load-balance flows across IA/x86 multicore CPU architectures
- Line-rate throughput for flow processing, packet inspection and capture
- Low Latency
  - <20µs cut-through at switch layer
  - <40µs cut-through at NFE
  - <100µs (inline application processing)

### Multi-layer Processing

- Three tiers of processing, each with increasing granularity
  - L2-L4 packet processing
  - L2-L7 flow processing
  - x86 cores for application and control plane processing

### Industry-leading Port Density

- Support for 28-1 GbE or 14-10 GbE interfaces per 2U
- Pluggable front-facing network modules (NM)
  - 4 x 1 GbE copper
  - 4 x 1 GbE fiber – SR
  - 2 x 10 GbE fiber – SR/LR SFP+
  - 2 x 40 GbE fiber
  - Stacking/uplink module
  - 240/480 Gbps switch module

### Flexible and Powerful Software

- Netronome Flow Driver (NFD) APIs provide a programmable hardware acceleration solution via a device driver, PCIe messaging datapath and tools for microengine (ME) programming
- Netronome Flow Manager (NFM) APIs to provide developers with an abstraction layer that controls the packet processing occurring in the NFE MEs

### High Availability

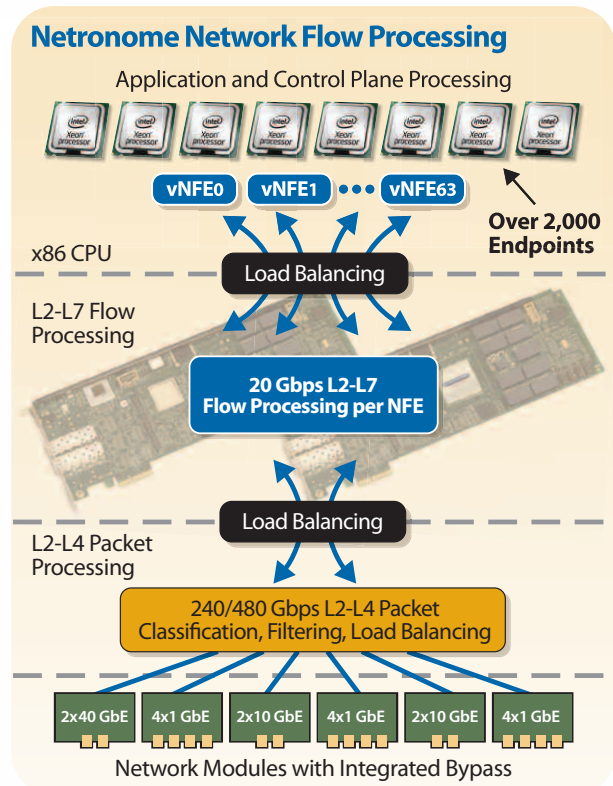
- Optional integrated bypass for inline applications
  - Fail-open/close on configuration, loss of power, system and application hangs
  - Software-configurable bypass API
- Configurable watch dog timer
- Independent per-port pair failover relays
- Redundant fans and power supplies
- SSD drives for code storage and data logging

### I/O Virtualization

- PCIe Gen2 x8 with enhanced IOV
- Support for over 2,000 unique endpoints

### Supported Platforms

- Standards-based, open architecture: Integrates with Linux®-based, IA/x86 systems via PCI Express
- 1U and 2U chassis variants
- 2U with 8 netmod slots (1 slot reserved for switch module)
- 1U with 4 netmod slots (1 slot reserved for switch module)



Netronome's Network Flow Engine PCIe cards offer a highly programmable heterogeneous multicore architecture that tightly couples the Netronome NFP microengine cores with the performance and ubiquity of general-purpose multi-core x86 systems over a high-speed virtualized PCIe datapath.



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Netronome has operations in:

USA (Pittsburgh [HQ], Santa Clara & Boston), UK (Cambridge), Malaysia (Penang), South Africa (Centurion) and China (Shenzhen, Hong Kong)

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