PRODUCT BRIEF

Intel® Ethernet Multi-host Controller FM10000 Family

Flexible 1, 2.5, 10, 25, 40, 100Gb Ethernet Ports

The Intel® FM10000 family combines industry proven Intel® Ethernet controller technology with advanced switch resources in a multi-host controller device that is an ideal solution for high-density rack scale server platforms and high-performance communications infrastructure applications. The FM10000 family supports enhanced features critical for today's need in high performance server environments: flexible high-bandwidth interfaces, low latency, advanced frame processing, and the ability to support a variety of network virtualization overlays (NVOs) through the use of integrated tunneling engines. The FM10000 family supports 1GbE, 2.5GbE, 10GbE, and 25GbE ports and the ability to group four lanes as 40GbE or 100GbE ports. The integrated Ethernet controllers can be configured as four 50Gbps or eight 25Gbps host interfaces, providing high-bandwidth connectivity into the attached Ethernet network.

FM10000 Family provides flexible interconnect to high-performance servers

Large scale data centers are now hosting both public and private clouds. These installations treat the server rack as the basic building block utilizing new rack scale architectures.

Traditional racks connect all servers through a top of rack (ToR) switch, requiring separate network adapter cards and cabling for each server sled. As shown in the Figure 3, the FM10000 family can aggregate traffic across multiple server sleds while providing flexible, high-bandwidth interconnect to the ToR switch, or between server shelves using ring or mesh topologies depending on the workload requirements. By aggregating server traffic, both cable count and ToR switch port count can be reduced within the server rack.

The FM10000 family can support up to 200Gbps of PCI Express* (PCIe) bandwidth while providing efficient load balancing across up to 8 PCIe interfaces to Intel® Xeon® processors. This level of integration reduces cost and improves performance in network appliance and Network Function Virtualization (NFV) applications.

In single host applications as shown in Figure 3, the FM10000 family can be used in 25GbE or 100GbE adapter cards which provide high bandwidth interfaces along with advanced Data Plane Development Kit (DPDK) acceleration enhancements to improve the performance of network functions while freeing up processor resources.

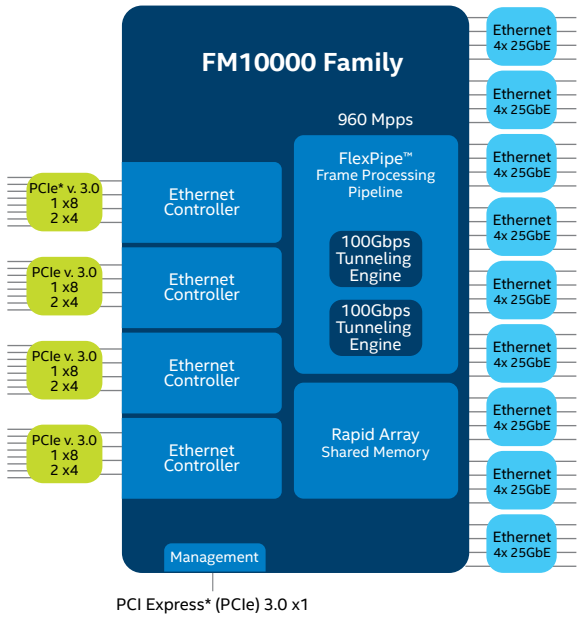

Figure 1. FM10000 family block diagram.

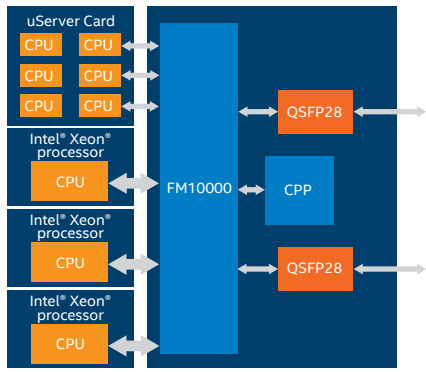

Figure 2. Multi-host Modular Server Platform.

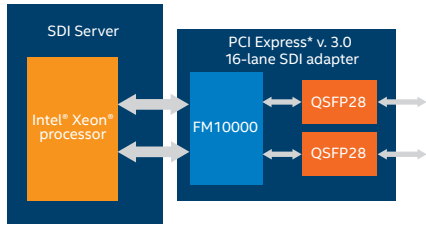

Figure 3. 100GbE Single Host SDI Adapter.

The vSwitches which interconnect the network functions on these NFV hosts are consuming more processor resources to support applications such as L3 routing, header field matching, network service chain tunneling, QoS and policy enforcement. The FM10000 family can accelerate many of these vSwitch function in hardware, freeing up processor cores and effectively reducing costs.

FEATURE	BENEFIT
MULTI-HOST INTERFACES	
• Up to four 50Gbps 8-lane PCIe* v. 3.0 • Up to eight 25Gbps 4-lane PCIe v. 3.0 • 64 VFs, 256 queues per interface • 1000nS host-network latency	• High-bandwidth processor interfaces • Eliminates multiple controllers • Traffic aggregation reduces cabling
ETHERNET PORT FLEXIBILITY	
• Up to 36 1GbE, 2.5GbE, 10GbE ports • Up to 24 25GbE ports • Up to 9 40GbE ports (4x 100G) • Up to 6 100GbE ports (4x 25G) • 300nS 100GbE latency	• Flexible network interfaces • 4-lane 100GbE support • Server shelf clustering options
SWITCH RESOURCES	
• 4 MB shared memory • L2/L3/L4/OpenFlow forwarding • 32K 40-bit TCAM entries • 16K MAC and NextHop tables • NSH Service Function Classifier and Forwarder	• Integrated TCAM • Policy enforcement • QoS support • Network address translation • Stateless load balancing to processors • DPDK acceleration enhancements
TUNNELING ENGINES	
• 56K exact match table • Full tunnel endpoint encap/decap • Support for NVGRE tunnels • Support for Geneve tunnels • Support for VXLAN_GPE tunnels • Support for NSH tunnels	• High performance network virtualization • DPDK acceleration enhancements
DATA CENTER BRIDGING FEATURES	
• Priority flow control • Enhanced transmission selection	• Provides lossless operation • Converged storage traffic
INTEGRATED ETHERNET CONTROLLERS	
• Independent DMA RX and TX functions • Priority Flow Control to/from fabric • 1588 time stamping • Descriptor pre-fetch IP/TCP/UDP checksum • Receive side scaling (RSS) • TCP segmentation offload (TSO/LSO) • Header split	• Full offload feature set • Support for SR_IOV • Stateless offload for NVO tunnels • DPDK integration • Standard Intel drivers

	FM10840	FM10420
Max PCIe* Data Ports	Four 8-lane Eight 4-lane	Two 8-lane Four 4-lane
Max SGMII/ 10GbE Ports	36	8
Max 25GbE Ports	24	8
Max 40GbE Ports	9	2
Max 100GbE Ports	6	2

For more information on the Intel® Ethernet Multi-host Controller FM10000 Family with flexible 1, 2.5, 10, 25, 40, 100Gb Ethernet ports visit:
www.intel.com/ethernet

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