COMPUTING

SharpSwitch™ PCIE-9202, PCIE-9204

Hybrid PCI Express Intelligent Network Interface Cards

Preliminary Data Sheet

The SharpSwitch PCIE-9202 and PCIE-9204 are hybrid intelligent network interface cards designed to simplify network traffic management in standard server platforms

- 3x QSFP28 for up to 300Gbps I/O bandwidth
- Direct data transfers between the NIC and Intel® Xeon® processers through PCIe
- Onboard Intel® Xeon® processor D for additional functionality (9204 version)
- Enabling L2/3 switching and load balancing
- Virtual switch
- Support for OpenFlow via Open vSwitch and OVSDB
- Enabling OpenStack software on LBaaS agent and DPDK

The Artesyn SharpSwitch™ PCIE-9202 and PCIE-9204 are network interface cards (NIC) with an embedded high-end switch in a PCI Express (PCIe) card form factor for use in standard server platforms. The embedded switch may be an element of a distributed networking backbone for a whole stack of servers where the server with the NIC gets a 100G access point into that network. A high-end CPU on the PCIE-9204 card can perform any kind sophisticated processing and balancing tasks on the selected packet flows.

The SharpSwitch PCIE-9202/4 cards support three (3) QSFP28 connections for up to 300 Gbps I/O bandwidth into the card's switch and a x16 PCIe Gen 3 channel to the server CPU which supports 100G Ethernet traffic. The CPU on the PCIE-9204 can process up to 50 Gbps via its own switch port.

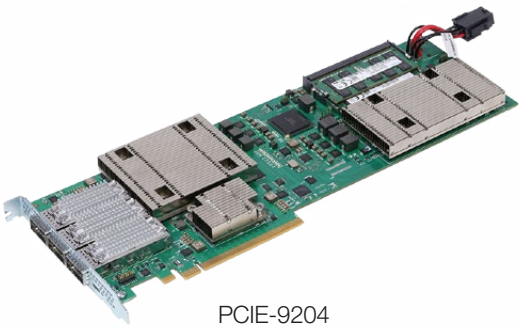
The SharpSwitch PCIE-9202/4 cards are based on the Intel® Ethernet Multi-host Controller FM10840 (Code name Red Rock Canyon), a combination of an Ethernet switch and several network adapters. Due to the switch-internals of this silicon, many pre-filtering and distribution tasks such as load balancing needed for such a system can be offloaded to the switch silicon before the packet even gets distributed.

Traditional servers racks require a top-of-rack (ToR) switch, which requires separate network adapter cards and cabling for each server sled. The SharpSwitch PCIE-9202/4 cards can be used to distribute network traffic between multiple servers without a ToR switch supporting either ring or mesh topologies depending on network requirements. The SharpSwitch PCIE-9202/4 cards can also be used with ToR switches, but used to aggregate network traffic and provide a flexible high bandwidth interconnect to a smaller number of ToR switches.

Some of the benefits enabled by the SharpSwitch PCIE-9202/4 cards include:

- On-board high-speed switch allows for load balancing on the network interface card, alleviating the need for expensive external load balancers
- Provide the infrastructure for implementing a sophisticated router
- Provide the infrastructure to support Open vSwitch offload, ensuring the maximum number of cores is available for payload processing in NFV applications
- I/O based on QSFP28s enables interface flexibility and allowing it to be tailored for the individual deployment environment

PCIE-9202



PCIE-9204

ARTESYN™
EMBEDDED TECHNOLOGIES

Virtual Switch to Augment Hardware Solution

In virtualized environments with dynamic workloads, virtual switches are required to forward packets internally and connect virtual machines to the outside world. In many cases, these virtual switches implemented with Open vSwitch, emulate the function provided by physical switches. But virtualized switching comes at a cost. In certain configurations, Open vSwitch has been shown to require as much as half of the available processor cores for switching the traffic to and from the VMs running on a given server. Artesyn's SharpSwitch PCIE-9204 card enables software developers to build their implementation of OVS offload. The Intel® Data Plane Development Kit (DPDK) is the ideal platform for optimal utilization of the CPU on the card.

Load Balancing Software

- The Intel® Ethernet Multi-host Controller FM10840 enables several hashing methods to load balance across ports and virtual functions
- "Lightweight" stateful load balancing is available through Equal-Cost Multi-Path routing
- OpenStack LBaaS functionality is implemented
- Implemented using Intel's DPDK library in Virtual Switch software

Switching Software

Switching software runs on the Intel® Xeon® D processor of the SharpSwitch™ PCIE-9202/4 and provides support to manage the Intel® Ethernet Multi-host Controller FM10840. Features supporting the SharpSwitch card include:

- VLAN Switching
- Static MAC and Static ARP configuration
- VLAN Stacking
- Static Channels (trunk)
- Static Routing
- Intervlan Routing
- Server Load Balancing
- MatchList
- Mirroring
- Error Threshold

SharpSwitch PCIE-9202 Features

- PCI Express card form factor, single width, full height, half length
- Built-in switch for:
  - Cut-through traffic (traffic entering and directly leaving the card)
  - Traffic between servers
- Intel® FM10840 Red Rock Canyon Ethernet Multi-host Controller
  - ~100GE aggregated internal platform bandwidth (PCIe x16 PCIe Gen3)
- 3x QSFP28 connectors capable supporting up to 3x100G, 12x25G, 3x40G, 12x10G or combinations of link speeds.
- Switch management utility for CentOS 7 on server CPU

SharpSwitch PCIE-9204 Features

- PCI Express card form factor, single width, full height, full length
- Built-in switch for:
  - Cut-through traffic (traffic entering and directly leaving the card)
  - Traffic between servers
- Intel® FM10840 Red Rock Canyon Ethernet Multi-host Controller
  - ~100GbE aggregated internal platform bandwidth (PCIe x16 PCIe Gen3)
- 3x QSFP28 connectors capable supporting up to 3x100G, 12x25G, 3x40G, or 12x10G
- Intel® Xeon® D 4-core processor
  - Up to 4 SODIMM slots
  - PCI Express Gen3 x8 connection to RRC switch
  - 2x SATA connection to local mass storage
  - 1x USB
  - 1x Reset
  - COM port access (serial console) with USB connection for simplified debugging
- Software includes Linux KVM, Intel® DPDK support, multi-host PCI Express I/O virtualization support

Ordering Information

Part Number	*Description*
PCIE-9202	SharpSwitch card, 1x Intel® FM10840
PCIE-9204	SharpSwitch card, 1x Intel® FM10840, 1x 4-core Intel® Xeon® D-1521 16GB ECC DDR4

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