100G 48-port Omni-Path Top-of-Rack Switch SSH-C48Q/SSH-C48QM

High Performance, High Density, Low latency, 100-Gigabit Omni-Path Architecture, Meets the Most Demanding Applications for HPC.

Supermicro SSH-C48Q 1U 48-port top-of-rack network switch products supports the 100Gbps Intel® Omni-Path Architecture (OPA) providing a unique HPC cluster solution offering excellent bandwidth, latency and message rate that is highly scalable and easily serviceable.

SSH-C48Q products 48-port 100Gbps supporting Omni-Path Architecture leverages the Intel Scalable System Framework (SSF) to address evolving demands across high performance data analytics, machine learning, visualization, traditional modeling and simulation workloads. Designed specifically for HPC, the 48-port SSH-C48Q products offer 9.6 Tb/s total fabric bandwidth. High scalability with the capability of 27,648 nodes in 2-tier configuration. Supermicro SSH-C48Q products are designed to overcome the scaling challenges of large-sized clusters. The enhancements include:

High Message Rate Throughput. The SSH-C48Q products are designed to support high message rate traffic from each node through the fabric. That means the fabric can support the high bandwidth as well as high message rate throughput associated with the ever-increasing processing power and core counts of Intel® Xeon® Processor and Intel® Xeon Phi™ coprocessors.

48-port Switch ASIC. With a 48-port design the SSH-C48Q products provide improved fabric scalability, reduced latency, increased density, reduced cost, and lower power demand. It is the basis of the SSH-C48Q products capacity of 9.6 Tb/s fabric bandwidth and high scalability to 27,648 nodes in 2-tier configurations.

Deterministic Latency. Features in the Intel OPA optimize the performance impacts of large Maximum Transmission Units (MTUs) on small messages. They help maintain consistent latency for inter-process communication (IPC) messages, such as Message Passing Interface (MPI) messages, when large messages-typically storage-are being simultaneously transmitted in the fabric. Intel® OPA can bypass lower priority large packets, giving higher priority to small packets, creating a lower and more predictable latency through the fabric.

Enhanced End-to-End Reliability. The Supermicro SSH-C48Q products also deliver its own unique error detection and correction which is more efficient than the forward error correction (FEC) defined in the InfiniBand standard. Enhancements include zero load for detection - if a correction is required, packets only need to be retransmitted from the last link-not all the way from the sending node. This gives near-zero additional latency.

Supermicro SuperSwitch Solution Benefit Highlights

- 1U TOR 100 Gb/s 48-Port
- 9.6 Tb/s Switching Capacity
- Optimized for High Message Rates and Low End-to-End Latency
- Out-of Band Fabric Management Card (SSH-C48QM only)
  - Ethernet (10/100/1000 Base-T) and USB Serial Console
- Redundant Hot-Pluggable 750W Platinum Level Power Supplies
- Redundant Cooling

Specifications

Ports
- 48 x 100 Gb/s ports – QSFP28
- RJ45 1G optional management port
- USB serial console port

Switching
- Switching capacity 9.6 Tb/s total fabric bandwidth
- Optimized high message rate
- Optimized error detection/correction and low latency
- Capability of 27,648 nodes in 2-tier configuration
- Virtual lanes: Configurable from one to eight VLs plus one management VL
- Configurable MTU size of 2KB, 4KB, 8KB, or 10KB
- Maximum multicast table size: 8192 entries
- Maximum unicast table size: 49151 entries
- Passive copper or active fiber cables

Management
- Out-of-band management card (SSH-C48QM only)
- Enables Command Line Interface and Chassis Management GUI through 10/100/1000 Base -T Ethernet
- Enables Serial Console through USB Serial Port
- Fabric Management GUI

Physical/Environmental
- Dimensions 17.2" W x 16.6" D x 1.72" H
- Weight 16 lbs / 7.26 kg
- Operating Temperature: 0°C to 40°C (32°F to 104°F)
- Forward Direction Air Flow

Power
- Redundant Hot-Pluggable 750W Platinum Level Power Supplies
- AC Input: 100-127V/200-240 V, 50-60 Hz
- Power consumption:
  - 210W (Copper)
  - 380W (All max 3W Optical)

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