

Cavium LiquidIO® II Smart NIC Family

Cavium LiquidIO® II Smart NIC for Network Appliances

Industry's Leading Smart NICs with Network and Security Acceleration

Product Brief

Cavium's LiquidIO® Adapters with dual port 40 Gigabit Ethernet connectivity, built using Cavium's market leading technology, provides best-in-class performance for Hyperscale, Telco, and Enterprise/Private datacenters with intelligent network acceleration.

Highlights

- I/O for next-generation agile data center – 10 / 40GbE bandwidth
- Network and security acceleration with maximum application performance
- Full custom programmability for faster time to market with new features
- Workload optimized software for performance and compute scalability

Introduction

Cloud infrastructure requires optimizing equipment for performance, cost and power at scale. Intelligent adapters can achieve these goals by moving specific workloads onto highly optimized adapter hardware, leaving the host server to run more efficiently. Moving network virtualization, storage protocols, security, SDN and network overlay to the adapter can dramatically improve overall OpEx and CapEx.

LiquidIO adapters provide flexible IO capabilities, advanced network and security hardware accelerators, and software support to provide the best-in-class performance for various cloud data center models, including hyperscale, Telco, enterprise and hybrid clouds. Server and network virtualization put extra demands on server infrastructure and LiquidIO adapters provide an efficient solution with high performance.

LiquidIO Features and Benefits

Network Virtualization and Overlay Network Offload

– In a multi-tenant cloud data center, VM isolation in a shared network infrastructure is critical.

As more VMs get hosted on powerful compute nodes, efficiently managing traffic from each VM is done using overlay networks. Overlay networks carry traffic from each VM encapsulated in formats such as VXLAN, NVGRE, and GENEVE.

With LiquidIO hardware capabilities, overlay network traffic encapsulation/de-encapsulation is accelerated by the adapter.

Agility – LiquidIO adapters delivers flexible architecture designed to meet the needs of users who want flexible 10GbE and 40GbE interface. The ability to be configured for 4 x 10GbE or 1x 40GbE per port, this family of adapters offers the agility required in the data centers.

Quality of Service (QoS) – Data center efficiency and scalability depends on the capabilities of a network adapter to manage, schedule, steer and prioritize traffic based on queue management, packet marking, congestion notification and priority based scheduling. LiquidIO supports various mechanisms to manage and shape traffic with dedicated independent queues in hardware. LiquidIO adapters support hierarchical levels with single or dual rate tri-color marking and per queue shaping and scheduling.

DPI Accelerators - The DPI hardware engine includes DPI HFA (Hyper Finite Automata) engine for generic packet analysis and for complex regular expression (regex) rules. Data centers can enhance cybersecurity with a rich set of supported crypto acceleration.

Flow identification with flexible tag generation for IPsec SPI and GRE tunnel protocol is supported in hardware, essential for packet classification.

DPI with L7 Application Recognition – Cloud networks must support the increase in data size and availability with the right cybersecurity analysis tools and software. LiquidIO hardware acceleration supports dedicated security and crypto engines to allow data analysis of traffic from L2-L7 with deep packet inspection, packet filtering and application recognition features to enhance security in data centers.

Full Custom Programmability - LiquidIO adapters are fully programmable making them the industry's most flexible and scalable with high performance, low cost solution for networking applications. The supported software packages accelerate data center networking with improved CPU efficiency, scalability and overall compute performance for any data center workload.

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Specifications, Compliance & Compatibility

Host Bus Interface Specifications

Bus Interface

- PCIe® Gen3 x8, Gen2 x8 (electrical) I/O Virtualization
- SR-IOV

Ethernet Frame

- Jumbo Frame Support

Stateless Offloads*

- TCP segmentation offload (TSO)
- Large send offload (LSO)
- Receive side scaling (RSS)
- Large receive offload (LRO)

Overlay Network Offloads*

- Virtual Extensible LAN (VXLAN)
- Network Virtualization using Generic Routing Encapsulation (NVGRE)
- Generic Network Virtualization Encapsulation (GENEVE)

* Any offload functionality may be customized and fully programmable by the customer.

On-board Memory

- 32GB DDR4 +ECC

Compliance

IEEE Specifications

- IEEE Std 802.3ae 10 Gigabit Ethernet
- IEEE 802.3 40GBASE-R
- IEEE 802.3ad Link Aggregation and failover
- IEEE 802.1Q.1p VLAN tags and priority
- IEEE 802.1Qbb (PFC)
- IEEE 802.1Qaz (ETS and DCBX)
- IEEE 1588

Operating Systems/Distributions*

- CentOS

*Please ask your Cavium representative about the latest supported O/S and Hypervisors.

Physical Specifications

Ports

- Dual port QSFP+ (40GbE)

Dimensions

- 247.65mm x 98.40mm

Agency Approvals—Safety

US and Canada

- cTUVus UL

Agency Approvals—EMI and EMC (Class A)

US and Canada

- FCC Rules, CFR Title 47, Part 15, Subpart Class A
- Industry Canada, ICES-003: Class A

Ordering Information

CN7890-240NV-32M-G

- Dual Port 40G QSFP+
- 48 Cores @ 2GHz
- 247.65mm x 98.40mm