Marvell Extends 1.6T Connectivity Leadership With Industry's First PAM4 Optical DSP Integrating 200 Gbps Electrical And Optical Interfaces

New Nova 2 PAM4 optical DSP enables greater performance and bandwidth density to optimize AI and cloud infrastructure

SANTA CLARA, Calif., March 25, 2024 /PRNewswire/ -- Marvell Technology, Inc. (NASDAQ: MRVL), a leader in data infrastructure semiconductor solutions, today announced Marvell® Nova 2, the industry's first 1.6 Tbps PAM4 optical DSP featuring 200 Gbps electrical and optical interfaces to meet the escalating performance demands of accelerated infrastructure, generative AI, and high-performance computing.

Marvell also announced that the flagship Nova optical DSP, a 1.6 Tbps device with 100 Gbps electrical and 200 Gbps optical interfaces announced last year, is now generally available. It will be showcased at the Marvell Booth (#2225) at OFC 2024 taking place this week in San Diego, California.

A breakthrough in optical connectivity technology, 1.6T Nova optical DSPs enable module manufacturers to develop a wide range of industry-standard form factor optical modules that deliver 2x more bandwidth than current 800 Gbps optical modules for the transition to 200G interfaces in accelerated infrastructure. Doubling optical module and interface bandwidth greatly increases the amount of network traffic that can be managed within the same physical space, thereby paving a pathway to scale capacity and increase return on infrastructure investments.

"200 Gbps signaling will be a defining feature for the next wave of AI clusters and cloud data centers and provide the performance needed to deliver services based on generative AI and large language models," said Xi Wang, Ph.D., vice president of product marketing for Optical Connectivity at Marvell. "The latest advancements in our Nova product family extend our longstanding leadership in PAM4 optical DSP technology to advance the industry towards next-generation cloud data center architectures."

Optical Technology for Accelerating Infrastructure
The intensive bandwidth and performance demands of AI and cloud workloads are fundamentally transforming, and accelerating, data infrastructure architectures. Bandwidth capacity in the cloud, measured by Ethernet ports shipped, continues to increase at over 50% per year while bandwidth for AI applications is growing at over 100% per year[1].

Optical DSP technology is critical for assuring signal integrity in high-speed, large and complex optical networks. The increasing need for greater connectivity bandwidth, the increasing size of AI clusters and cloud data centers, and the greater distances between nodes mean that optical DSPs are becoming more pervasive and more performant.

"Networking and connectivity are the linchpin for AI," said Alan Weckel, co-founder of 650 Group. "We are seeing increased focus on the performance of switches and optical modules by hyperscale cloud providers because they understand that networking performance is absolutely vital to the success of these new services. Nova 2 is the latest milestone for Marvell and the industry."

The Nova family leverages four generations of proven industry leading PAM4 optical DSP technology from Marvell. Newly announced Nova 2 features eight 200 Gbps electrical lanes to the host device and eight 200 Gbps optical lanes to interface with a wide range of optical components to enable 1.6T total bandwidth that can fit inside standardized module form factors utilizing eight electrical lanes. Nova 2 based optical modules support backward compatibility for up to three generations. Nova 2 is designed for next-generation AI networking fabric infrastructure where switches, network interface cards (NIC), and accelerators will be based with 200 Gbps I/O interfaces. The first flagship Nova device is designed for connecting devices based with 100 Gbps electrical I/O interfaces, used in clouds today.

"Marvell is once again bringing an industry-first 1.6T optical DSP to the pluggable optics ecosystem and delivering the connectivity speed needed to tackle the most demanding AI workloads," said Osa Mok, chief marketing officer, InnoLight Technology. "The Marvell Nova 2 DSP, combined with InnoLight's high-speed optical transceiver design and manufacturing capabilities, brings to the industry a state-of-the-art pluggable module for doubling bandwidth capacity for the growing performance requirements of data center infrastructure."

Key features of the Nova 2 electro-optics platform include:

- 200 Gbps per lane line-side transmitter interface supporting a wide range of high-speed lasers
- 200 Gbps per lane line-side receiver with companion Marvell TIAs, providing best-in-class linearity and low noise
- Integrated laser drivers, optimizing power dissipation and transmit performance
- Latency-optimized FEC for 200 Gbps traffic

Availability
The Marvell 1.6T Nova 2 optical DSP with 200 Gbps electrical and optical interfaces is sampling in the second quarter of 2024 to select customers. The Marvell 1.6T Nova optical DSP with 100 Gbps electrical and 200 Gbps optical interfaces is generally available.

About Marvell
To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for over 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.

1.650 Group, Ethernet Switch Reports, 4Q 2023, March 4, 2024.

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