

# Marvell Delivers Industry's First 800 Gbps CDSP For Pluggable Modules, Advancing Optical Transport Networks And Data Center Interconnects

- *5nm Marvell® Orion™ coherent DSP enables carriers and clouds to replace traditional transport equipment for better scalability and TCO.*
- *With 2x bandwidth over current coherent DSPs for pluggable modules, Orion increases the performance and reach of pluggable module-based connections to up to ~2,000 km.*
- *Orion expands the opportunity to deploy coherent DSP-based modules in more use cases, including 800 Gbps metro networks, 600 Gbps regional networks, 400 Gbps long-haul networks and 800 Gbps data center interconnects.*

SANTA CLARA, Calif., Aug. 23, 2023 /PRNewswire/ -- [Marvell Technology, Inc.](#) (NASDAQ: MRVL), a leader in data infrastructure semiconductor solutions, today announced [Orion](#)—the industry's first 800 Gbps coherent digital signal processor (DSP) for pluggable modules—to change the economics and performance of the transport networks connecting carrier and cloud assets over extended geographic areas.

Delivering 2x the maximum bandwidth over today's leading solutions while staying within the stringent thermal and electrical limits of pluggable modules, Orion gives carriers and cloud service providers the opportunity to shift from building transport networks with traditional optical transport networking transmission equipment to designing networks around streamlined, scalable architectures built on merchant routers, integrated optical modules and other technologies for a lower total cost of ownership.

Orion-based pluggable modules are expected to deliver up to 75% in capex and opex savings over traditional transport equipment for popular carrier use cases such as metro networks<sup>1</sup>. Orion-based modules are also expected to provide 30% lower cost and power per bit compared to currently available pluggable modules<sup>2</sup>.

Spanning a wider range of transport lengths and bandwidth capacities, Orion increases the performance of pluggable modules across multiple use cases, including:

- Metro network connections (~500km) delivering 800 Gbps per wavelength, 2x the bandwidth of current state-of-the art pluggable modules.
- 600 Gbps regional network connections (~1,200km) for core networks built around standards-based modules and routers based on IP over DWDM (IPoDWDM) to reduce cost and complexity of infrastructure.
- 400 Gbps long-haul connections (up to ~2,000km) in traditional or IPoDWDM networks.
- 800 Gbps (~500km) and 600 Gbps (~1,200km) ZR/ZR+ data center interconnects to scale network capacity quickly and economically to accommodate the surging traffic from AI and other distributed, data-intensive workloads.

"Orion represents a tipping point for optical transport technology. With Orion, pluggable modules will be able to be deployed across these complex, high-performance networks while delivering substantial reductions in cost and power. Orion-based modules will also deliver the bandwidth needed for data center interconnects to meet the exploding demand for AI," said Achyut Shah, Senior Vice President and General Manager of the Connectivity Business Group at Marvell. "Fueled by the innovation of our partners, pluggable modules based on Orion will become the leading choice for carriers and clouds."

## A Versatile Architecture

Produced on 5nm technology, Orion is the fifth generation coherent DSP from Marvell and offers twice the bandwidth in the same small module form factors as Deneb™ and Canopus™, Marvell's market-leading 400 Gbps coherent DSPs that have been widely adopted by carriers and clouds.

Orion is the industry's first coherent DSP supporting standards-based pluggable form factors at symbol rates in excess of 130+ GBaud, which allows Orion-based modules to transfer data at a faster rate and across longer distances than current modules. Orion incorporates Marvell's 112 Gbps SerDes developed as part of Marvell's technology platform for 5nm devices.

Orion complies with OIF, OpenZR+, OpenROADM, and IEEE standards and can be used in the QSFP-DD, OSFP, and CFP2 form factors, making it an ideal DSP solution to support widespread transition into coherent pluggable-enabled architectures.

Orion-based modules will also pave the way for greater adoption of IPoDWDM. Many carriers are in the midst of once-in-a-decade upgrade of their core network routers—which can cost hundreds of thousands of dollars and

occupy multiple racks—from 100 Gbps to 400 Gbps. Coupled with Orion-based modules, 400 Gbps IPoDWDM routers can match the performance of existing transport equipment at a far lower cost.

"Marvell's Orion DSP represents the next step in coherent pluggables after the unprecedented popularity of 400 Gbps modules," said Scott Wilkinson, Lead Analyst for Optical Components at Signal AI. "Orion creates the opportunity to eliminate hardware and significantly reduce costs in regional to long-haul networks, and our conservative forecast calls for nearly 300,000 shipments of 800 Gbps-capable pluggable modules a year by 2027."

### **Customers and Partners**

Marvell's growing ecosystem of module partners is actively engaged in developing Orion-based solutions.

### **Fujitsu Optical Components Ltd.**

"Marvell's cutting-edge technology enables pluggable solutions for advancing carrier networks, DCI, and other emerging AI applications. We are thrilled to integrate the Orion DSP into our coherent transceivers that will meet market demands for scalability and reduced power consumption."

--Yukiharu Fuse, Executive Director, Fujitsu Optical Components Ltd.

### **InnoLight**

"Orion is a milestone in infrastructure because it expands the applications for pluggable technology. Long-haul is now a use case suitable for coherent modules. The collaboration between InnoLight and Marvell will fuel this transition for carriers and cloud providers."

--Osa Mok, CMO, InnoLight

### **Lumentum**

"We are excited to collaborate with Marvell on the development of 800 Gbps pluggable technologies that combine Marvell's DSP with Lumentum's high-performance integrated optics. Leveraging Lumentum's proven track record of innovation, vertical integration, operational excellence, and the industry's widest range of high-speed optical technologies, our collaboration creates cutting-edge IP-over-DWDM pluggable solutions that enable the continued scaling of data center interconnect and metro network capacity."

--Marc Stiller, Vice President Product Line Management, Coherent Modules, Lumentum

### **Availability**

Orion is sampling now to select customers.

### **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.

- Signal AI, Marvell estimates
- Marvell estimates

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### **For further information, contact:**

Michael Kanellos  
[pr@marvell.com](mailto:pr@marvell.com)

Additional assets available online: [Photos \(1\)](#)

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