Astera Labs First to Demonstrate End-to-End PCIe over Optics for GPU Clusters Across the Data Center

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Company extends its PCIe connectivity leadership to increase GPU cluster scale and utilization in disaggregated AI and cloud infrastructure

SANTA CLARA, Calif.--(BUSINESS WIRE)--Jun. 11, 2024-- Astera Labs (Nasdaq: ALAB), a global leader in semiconductor-based connectivity solutions for AI and cloud infrastructure, today unveiled the industry's first demonstration of end-to-end PCIe® optical connectivity to provide unprecedented reach for larger, disaggregated GPU clusters. The company's breakthrough technology for PCIe over optics expands its widely deployed, field-tested Aries family of Smart DSP Retimers and Smart Cable Modules™ (SCMs) for Active Electrical Cables (AECs) to deliver robust PCIe and CXL® connectivity in chip-to-chip, box-to-box, rack-to-rack, and now row-to-row topologies throughout the data center.

Casey Morrison, Chief Product Officer, Astera Labs, said, "GPU clusters are growing in size to handle the expanding complexities of AI workloads within disaggregated cloud infrastructure. We're proud to broaden our PCIe leadership once again by demonstrating robust PCIe links over optical interconnects between GPUs, CPUs, CXL memory devices, and other PCIe endpoints. This breakthrough expands our Intelligent Connectivity Platform to allow customers to seamlessly scale and extend high bandwidth, low latency PCIe interconnects over optics including Active Optical Cables in addition to copper-based AECs."

Large AI models benefit from tightly clustering more GPUs over a backend mesh network often using PCIe interfaces that are natively found on GPUs. Larger GPU clusters must be distributed beyond a single rack to meet power delivery and cooling requirements. PCIe optical interconnects are essential to scale PCIe based GPU clusters to multiple racks and rows, improve AI model performance, and increase GPU utilization.

Alan Weckel, Co-Founder and Technology Analyst, The 650 Group, observed, "PCIe optical technology is a critical development that will support hyperscalers to address the high-speed connectivity demands of their AI and cloud infrastructure, which are rapidly increasing in both scale and complexity. As a leader in PCIe, Astera Labs' end-to-end PCIe connectivity over optical fiber represents a significant breakthrough for the industry to deploy high bandwidth PCIe in AI clusters at data center scale."

Astera Labs' new technology for PCIe over optics operates with end-to-end PCIe link connectivity in compliance with current PCIe specifications and is flexible to address future standards requirements through software-enabled configurability. The company is collaborating with leading optical cable suppliers to enable a wide variety of industry standard form factors.

Nathan Brookwood, Research Fellow, Insight 64, noted, "Optical interconnects are an important evolution for PCIe architecture that will have a significant impact on a wide variety of markets and applications that leverage the high bandwidth, low latency connectivity standard. Astera Labs' demonstration of its new PCIe over optics solution is an impressive milestone that will enable the industry to unlock even larger, more powerful AI clusters in hyperscale and cloud data centers."

Astera Labs' COSMOS software suite has been enhanced to provide link, fleet, and RAS management features over optical links, delivering deep insights into every lane and link inside a cluster to facilitate maximum uptime and optimal infrastructure utilization. Customers already using Astera Labs' Intelligent Connectivity Platform will be able to seamlessly and transparently enable optical interconnects.

Resources:

- [First Demo of End-to-End PCIe Over Optics for GPU Clusters Across the Data Center \[Video\]](#)
- [Extending Our Connectivity Leadership: Industry's First End-to-End PCIe over Optics Demo \[Blog\]](#)

About Astera Labs

Astera Labs is a global leader in purpose-built connectivity solutions that unlock the full potential of AI and cloud infrastructure. Our Intelligent Connectivity Platform integrates PCIe®, CXL®, and Ethernet semiconductor-based solutions and the COSMOS software suite of system management and optimization tools to deliver a software-defined architecture that is both scalable and customizable. Inspired by trusted relationships with hyperscalers and the data center ecosystem, we are an innovation leader delivering products that are flexible and interoperable. Discover how we are transforming modern data-driven applications at **www.asteralabs.com.**

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