Synopsys Launches Industry's First Complete 1.6T Ethernet IP Solution to Meet High Bandwidth Needs of AI and Hyperscale Data Center Chips

Solution Helps Future-Proof Infrastructure Using New 1.6T Ethernet Controller IP, Silicon-Proven 224G PHY IP, and Verification IP

Highlights:

- Available now and adopted by multiple customers, Synopsys' complete 1.6T Ethernet IP solution, reduces interconnect power consumption by up to 50% compared to existing implementations
- New multi-channel/multi-rate Ethernet controllers offer 1.6T support with up to 40% latency reduction and up to 50% area reduction compared to existing multi-rate 800G IP solutions
- Silicon-proven 224G Ethernet PHY IP is customizable to support chip-to-chip, chip-to-module, and copper cable connections optimizing power and performance tradeoffs
- Synopsys verification IP for 1.6T Ethernet accelerates verification closure with a comprehensive set of protocol, methodology, and productivity features

SUNNYVALE, Calif., Feb. 29, 2024 –Synopsys, Inc. (Nasdaq: SNPS) today delivered a dramatic increase in bandwidth and throughput for data-intensive AI workloads with the industry's first complete 1.6T Ethernet IP solution. Hyperscale data centers, a backbone in the era of pervasive intelligence, require high-bandwidth, low-latency chips and interfaces to process petabytes of data quickly. Synopsys' new 1.6T Ethernet IP solution enables design teams to create the industry's fastest chips for AI and data center networking applications.

Synopsys is enabling hyperscale data center providers, and the ecosystem that serves them, to future-proof their infrastructure via their silicon roadmap, using the industry's most extensive, interoperable, and proven IP portfolio:

"Massive artificial intelligence and machine learning workloads are accelerating the need for 1.6T Ethernet in data centers," said Ram Periakaruppan, vice president and general manager, Network Test & Security Solutions, Keysight Technologies. "The combination of Synopsys' new 1.6T Ethernet controllers and robust 224G Ethernet PHY IP and Keysight's IxVerify pre-silicon test solution are essential to helping customers design the world's fastest, most reliable system on a chip devices."

"Insatiable demand for high-speed data access is pushing hyperscale cloud providers to upgrade their networking infrastructure to maintain their competitive edge" said Keith Guetig, vice president of Product Management, Samtec. "With successful interoperability between this and many prior generations of Synopsys' high-quality Ethernet solutions and Samtec's high-speed FlyOver® cable assemblies, chip designers and system architects can reduce their design risk when developing the next generation of SoCs for cloud, AI, and 5G applications."

"With growing demands from large language modeling, HPC simulation, and AI training in hyperscale data centers, network boundaries are crossing over the Terabits per second threshold," said Peter Jones, chairman, Ethernet Alliance. "The availability of development tools capable of meeting these needs is critical to the success of next-generation Ethernet standards addressing this market."

"The massive compute demands of hyperscale data centers require significantly faster Ethernet speeds to enable emerging AI workloads," said John Koeter, senior vice president of marketing and strategy for IP, Synopsys. "Our complete IP solution for 1.6T Ethernet, pre-verified subsystems, successful ecosystem interoperability, and decades of expertise in developing and delivering the industry's broadest interface IP portfolio allow designers to confidently integrate the necessary functionality into their SoCs with less risk."

Synopsys Complete 1.6T Ethernet Solution

Synopsys' comprehensive IP solution, including new 1.6T MAC and PCS Ethernet controllers,224G Ethernet PHY IP, and verification IP, accelerates time to market for AI and HPC networking chips. The complete 1.6T Ethernet IP solution optimizes hyperscale data center energy efficiency by reducing interconnect power consumption by up to 50% compared to existing SoC implementations. The new multi-channel, multi-rate Synopsys 1.6T Ethernet MAC and PCS Controllers decrease area by 50% and reduce latency by 40% by implementing a patented Reed-Solomon Forward Error Correction architecture, while helping ensure reliable data for Ethernet rates from 10G to 1.6T. The silicon-proven 224G Ethernet PHY IP delivers robust link performance with exceptional signal integrity and seamless ecosystem interoperability for multiple channel lengths. The industry's first Ethernet verification IP for up to 1.6T speeds, implemented in native SystemVerilog and Universal Verification

Methodology, speeds time to first test.

Availability and Additional Resources
The Synopsys 1.6T Ethernet solution, including all components – 1.6T MAC and PCS Controller IP, 224G PHY IP for advanced processes, and Verification IP for 1.6T Ethernet – are available now.

- Blog: Meeting the Growing BW Demands with a Complete 1.6T Ethernet IP Solution
- Webinar: Key MAC Considerations for the Road to 1.6T Ethernet Success
- Video: How 1.6T Ethernet Meets the Bandwidth Needs of AI & Hyperscale Data Center SoCs
- Web: Complete 1.6T Ethernet IP Solution

About Synopsys
Catalyzing the era of pervasive intelligence, Synopsys, Inc. (Nasdaq: SNPS) delivers trusted and comprehensive silicon to systems design solutions, from electronic design automation to silicon IP and system verification and validation. We partner closely with semiconductor and systems customers across a wide range of industries to maximize their R&D capability and productivity, powering innovation today that ignites the ingenuity of tomorrow. Learn more at www.synopsys.com.

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