Canoga Perkins' SyncMetra® Delivers Ultra-low Latency, AI-Capable 5G Connectivity with AMD Virtex™ UltraScale+™ FPGAs

Programmable logic and high-speed I/O gives designers agility to tailor telco-grade solutions for critical, time-sensitive networking (TSN) applications

AMD × CANOGA PERKINS

"Canoga Perkins is a 60-year-old company with a start-up mentality. We're nimble to embrace innovation, and we're responsive to our customers' unique challenges," said Siddharth Khattar, chief of staff and vice president of strategic implementation at Canoga Perkins. "We design to the highest quality standards, because there's a lot riding on the networks we design."

Customers with mission-critical applications look to Canoga Perkins for Time-Sensitive Networking (TSN) solutions equipped for deterministic, low-latency, and reliable data delivery, enabling real-time communication for applications like industrial automation, enterprise edge AI, and private 5G. For these applications and many more, AI inferencing requires 5-7 millisecond cycle times. By reducing the transport latency to sub 5 microseconds, Canoga Perkins' solution allows sensory inputs to be quickly aggregated enabling inference based on a more complete data set.

From healthcare settings to the manufacturing floor, customers count on Canoga Perkins wireless connectivity when reliable, low-latency, robust communication is essential. The ability to transmit image-heavy, real-time patient data for instant AI analysis holds the promise to save lives. Precisely orchestrated industrial workflows can prevent downtime costing hundreds of thousands of dollars per second.

Canoga Perkins' new SyncMetra® 5G transport platform is optimized for time-critical applications like these, underpinning private 5G networks for some of the most complex use cases facing industry and enterprises today. At the heart of the SyncMetra®, AMD Virtex™ UltraScale+™ FPGAs are integral to the innovation.

CHALLENGE

"As advancements in AI and IoT accelerate, our customers want to be ahead of the curve in wireless enablement but often find themselves challenged to change processes after prolonged and typically unsuccessful efforts to scale legacy tech beyond its capability," said Khattar. "Wi-Fi and commercial 5G are limited in their ability to provide the kind of guaranteed low latency required for the most demanding and in-demand industrial use cases. We show customers a better way forward."

Enabled with private 5G connectivity, industrial network owners can achieve major benefits with a programmable, deterministic communications approach for automation applications from precision manufacturing processes and automated mobile robots (AMRs) to material handling and container transport robots.

INDUSTRY

5G Networking

CHALLENGES

Canoga Perkins anticipated the growing demand for time-sensitive networking (TSN) and AI-caliber private 5G, where reliability, robustness and latency are paramount concerns. To achieve deterministic, ultra-low-latency communication for mission-critical requirements, the Canoga Perkins design team needed a processing platform that's suitably high-performance and adaptable for diverse target applications.

SOLUTION

AMD Virtex™ UltraScale+™ FPGAs deliver the parallel processing, ultra-low latency, integrated memory and deterministic performance essential for TSN requirements. The high-speed I/O and programmable logic enable robust connectivity, precise synchronization, and adaptability for wireless 5G networks supporting AI inferencing at the edge.

RESULTS

Canoga Perkins' SyncMetra® 5G systems, powered by AMD Virtex™ UltraScale+™ FPGAs, are differentiated in their ability to enable software-defined, deterministic transport providing Ultra Reliable Low Latency Communication (URLLC) and guaranteed packet delivery. Engineered for telco reliability, SyncMetra® is purpose-built to simplify the deployment of private 5G networks for industrial automation and enterprise AI.

AMD TECHNOLOGY AT A GLANCE

AMD Virtex™ UltraScale+™ FPGAs

Digital twin implementations can benefit from microsecond network latency by enabling real-time synchronization between physical and virtual systems. This is essential for accurate simulation and closed-loop control in high-speed industrial environments.

Enterprise AI deployments, likewise, can achieve significant productivity and efficiency gains for a wide spectrum of inference-at-the-edge use cases, including physical security, retail, quality assurance and predictive maintenance.

Legacy connectivity platforms have inhibited the performance, scalability, and cost optimizations that these applications need to thrive, while moving inferencing away from the sensor and into the cloud, with the latency and expense that entails.

SOLUTION

Canoga Perkins' new SyncMetra® ultra-low latency 5G platform for industrial and enterprise AI applications is powered by AMD Virtex™ UltraScale+™ FPGAs, providing the highest performance and integration capabilities in a 16 nm FinFET node and unrivaled signal processing and serial I/O bandwidth to satisfy the most demanding design requirements.

SyncMetra® is distinguished as a software-defined, IT-operated private 5G network transport solution that guarantees ultra-low latency, deterministic wireless communications for industrial automation, enterprise AI and beyond. Optimized for AI enablement, Canoga Perkins' SyncMetra® provides performance and features that enable inferencing to take place on-premises, consolidating multiple sensor feeds and reducing total cost of ownership.

"SyncMetra® is different from anything we have done previously. It's a modular switch with three slots on the chassis. Each is an I/O slot that can handle 400 gigabits per second of traffic. It's a scalable solution from 400 gigabits per second all the way to 1.2 terabits per second," Khattar said.

"AMD Virtex™ UltraScale+™ FPGAs give us the performance, programmability, scalability, optimization and reliability to achieve what competing FPGAs or other solutions could not. Another crucial element is the memory resources built into the chip. With the amount of memory onboard the AMD Virtex™ UltraScale+™ FPGA we're able to create deep packet buffers to support packet switching and routing that doesn't lean on external memory. This is an important factor in reducing latency, enabling SyncMetra®-powered implementations with deterministic, end-to-end guaranteed delivery," he added.

RESULTS

SyncMetra® is the only transport solution of its kind in the market, able to offer software-defined, deterministic transport providing Ultra Reliable Low Latency Communication (URLLC) and guaranteed packet delivery. A programmable and expandable alternative to Wi-Fi and commercial 5G, SyncMetra® empowers IT departments to deploy 5G wireless networks as simply as Wi-Fi, without an over-reliance on telco expertise or cost-prohibitive telco hardware.

"The SyncMetra® product family brings TSN capabilities to modern wireless and data center communications. It's a true breakthrough in ultra-low latency 5G transport solutions in that it enables the full promise of AI-guided automation and efficiency, supporting advanced applications like digital twins. These applications aren't off on the horizon, they're here today and our customers are reaping the benefits," Khattar said.

"Most connectivity vendors establish service level agreements (SLAs) for bandwidth. Canoga Perkins guarantees SLAs for latency as well. This is unique in the industry, and AMD Virtex™ UltraScale+™ FPGAs enable this differentiation," he added.

"Networks need low latency and determinism to support the applications of today and tomorrow. AI at the edge, in particular, is an area where the need for latency, determinism, reliability, and bandwidth really comes together," Khattar continued. "SyncMetra® answers these requirements with a software-defined, guaranteed low-latency connectivity architecture that's perfect for industrial automation and enterprise AI."

Want to learn more about AMD Virtex™ UltraScale+™ FPGAs?
Visit our website.

ABOUT CANOGA PERKINS

Founded in 1965, privately held Canoga Perkins has a long history of providing mission-critical, secure communications to service providers, the military, government agencies, and utilities. Canoga Perkins is differentiated by the telco reliability of its products and its ability to anticipate and nimbly act on emerging IT trends. Canoga Perkins is a leading technology provider for 5G network infrastructure. To learn more, visit www.canogaperkins.net

ABOUT AMD

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