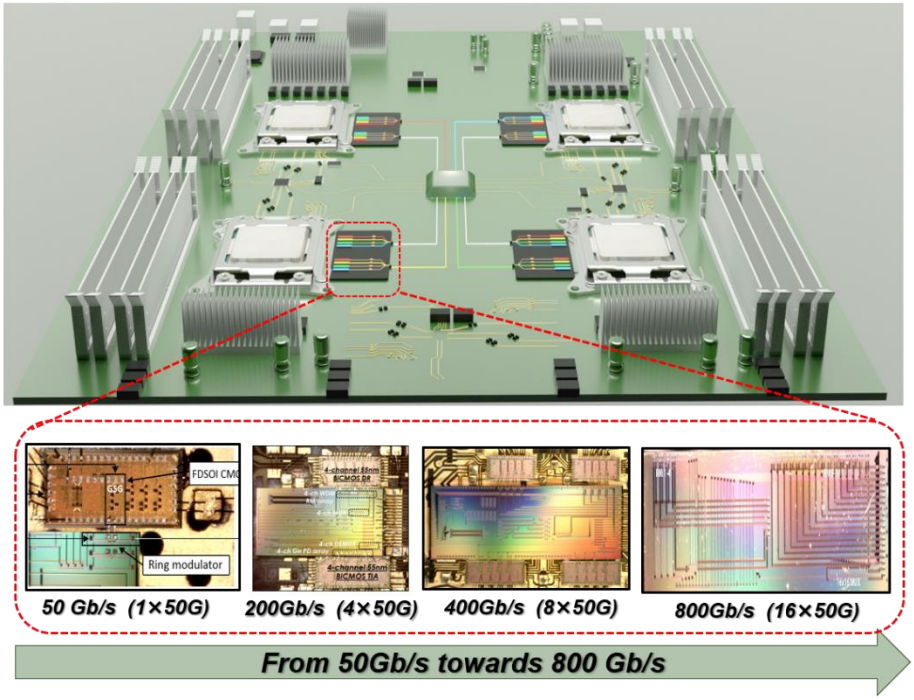
FINAL PRESS RELEASE OF ICT-STREAMS

www.ict-streams.eu



"The ever-increasing demands for higher computational powers in mega Data Centers (DC) and HPCs combined with the need for low power consumption have been long pushing Multi-Socket Server Board (MSB) and pluggable optics interconnect solutions to their limits. Connecting a high-number of high-performance CPUs (sockets) through Multi-Socket Server Boards over a low-latency and low-energy interconnect can boost computational power at board-level, while scaling the bandwidth of pluggable optics from current 100GbE to next-generation 400 GbE, 800GbE and up to 1.6TbE appears as the only way to meet the constantly growing networking demands in DC and HPC environments. The recently completed EU-funded ICT-STREAMS project took up – and overcame – these challenges by successfully leveraging a set of innovative technologies for building high-speed and low power optical transceiver engines and board platform, realizing a radically new approach of WDM routing architecture to enable high bandwidth, low-power and direct point-to-point interconnections. Four industrial partners and four academic and research institutes combined their know-how and expertise in photonic integrated circuits (PICs), system level interconnect architecture and optoelectronics and demonstrated an optically-enabled MSB interconnect technology that can support >8-sockets with significant power savings compared to the current electronic standards. As Dr. Theoni Alexoudi, technical leader of the project coordinating institute Aristotle University of Thessaloniki, mentioned: "The project has established a new paradigm for transceiver and board-level interconnect

architectures that is compliant with current and future Ethernet standards, follows DC vendors specifications and sets the ground for the next generation 1.6Tb/s transceiver modules".

Key achievements

A major achievement of the project was the development of novel WDM-based silicon photonic transceiver modules, demonstrating i) a 0.4TBit/s (400 Gbit/s) sub-assembly through 8 individual 50Gb/s silicon transceivers mounted with its electronic circuitry on a 50GHz polymer board, and ii) 0.8TBit/s transmitter modules, scaling the number of optical channels to 16 through respective individual transceivers. As the project coordinator Prof. Nikos Pleros pointed out, these transceiver modules have allowed ICT-STREAMS to implement and demonstrate a low-energy ultra-fast interconnect for MSBs, reducing energy consumption by 68% compared to the Intel's QPI while releasing 400Gb/s socket communication capabilities and glueless MSBs with >8 sockets. This MSB interconnect can operate seamlessly without requiring temperature stabilization through a novel Thermal Drift Compensation System that was demonstrated by the project partners. This TDCS employs non-invasive integrated photonic temperature monitors and a feedback mechanism for allowing complex photonic circuitry within the MSB architecture to sustain successful operation despite the great temperature differences typically encountered in computing engines.

STREAMS (Silicon Photonics Transceiver and Routing technologies for High-End Multi-Socket Server Blades with Tb/s Throughput interconnect interfaces) concluded in October 2019. Its research has led to the launch of novel transceiver and routing technologies and its partners expect that the next step might be the commercialization of these new promising components."

For more information, please see:

ICT-STREAMS project website
www.ict-streams.eu