NEWSLETTER

ISSUE
02
SEPTEMBER 2023

OCTAPUS

Optical Circuit switched Time sensitive network architecture for high-speed Passive optical networks and next generation Ultra-dynamic & reconfigurable central office environments

HORIZON EUROPE
The New EU Framework Programme for Research and Innovation
2021-2027

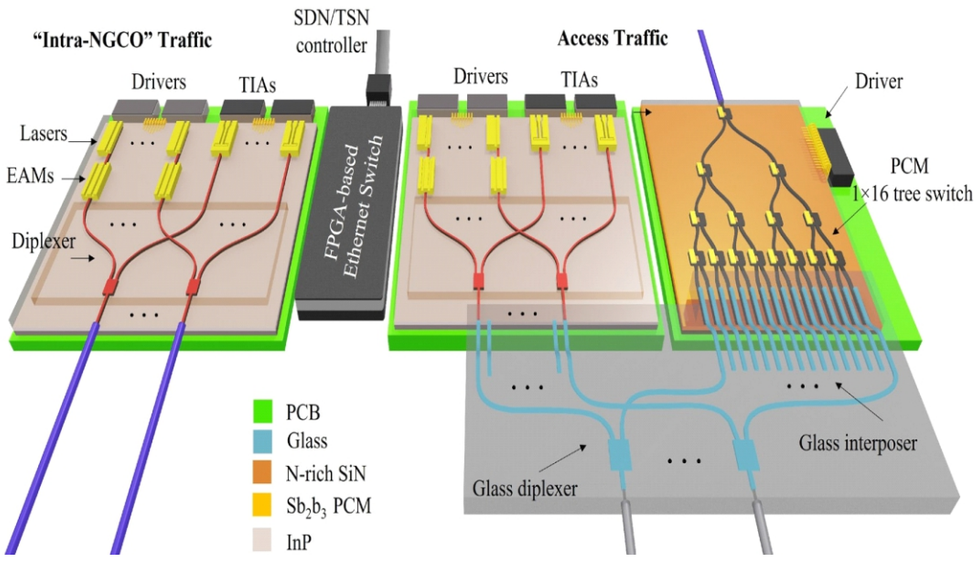
PHOTONICS21
PHOTONICS PUBLIC PRIVATE PARTNERSHIP

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The OCTAPUS Vision

To deliver an agile, low-cost and energy efficient PIC technology framework that will re-architect the NGCO (Next Generation Central Offices) ecosystem, transparently upgrading its capacity to 51.2Tb/s and beyond, through an innovative optically switched backplane and transceiver toolkit allowing three layers of traffic provisioning; i.e., optically switched express path time-sensitive & best-effort traffic classes.



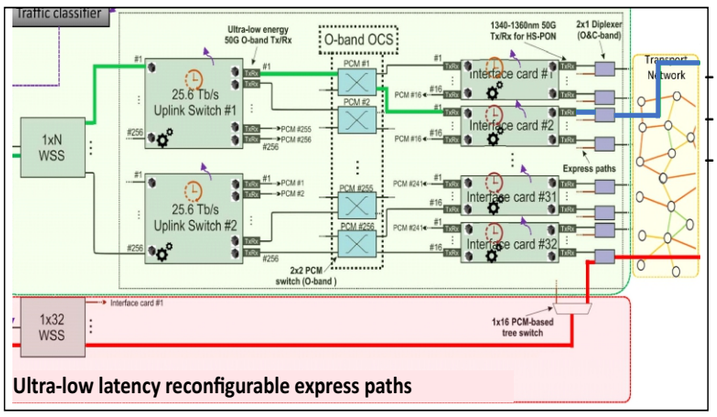
Consortium

WinPhoS Research Group
COMCORES
teem PHOTONICS
COSMOTE
NEXTWORKS
imec
SMART PHOTONICS
UNIVERSITY OF Southampton
Fraunhofer IZM
NVIDIA
orange

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Coordinator Aristotle University of Thessaloniki (GR)
Contact **Prof. Nikolaos Pleros** (npleros@csd.auth.gr)
Dr. Chris Vagionas (chvagion@csd.auth.gr)
Dr. Marios Gatzianas (mgkatzia@csd.auth.gr)

Technical Progress

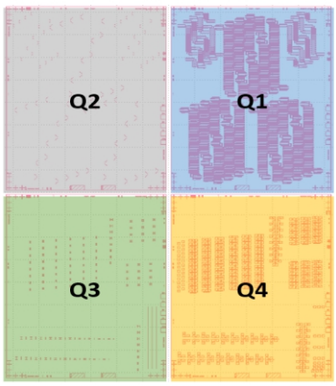
1 System Architecture and Network Topology

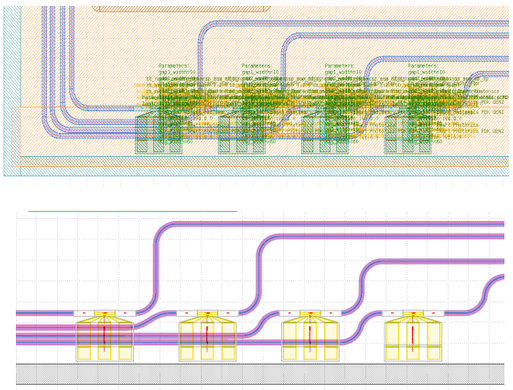


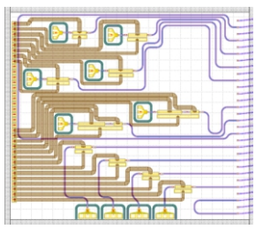
Link1: *Short Reach path – O Band*
Link2: *Long Reach path – extended O Band*
Link3: *Express Path – C Band*

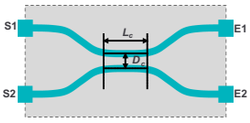
Power budget, link distance, PON splitting rations have been calculated.

2 Development of Optical Switching Components







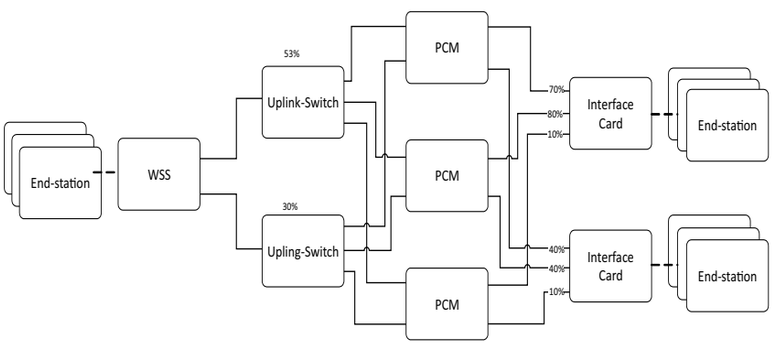


► The 1st generation of PCM switching elements and InP Tx/Rx, EAMs, MZMs designs and masks have been completed, moving to the fabrication stage.

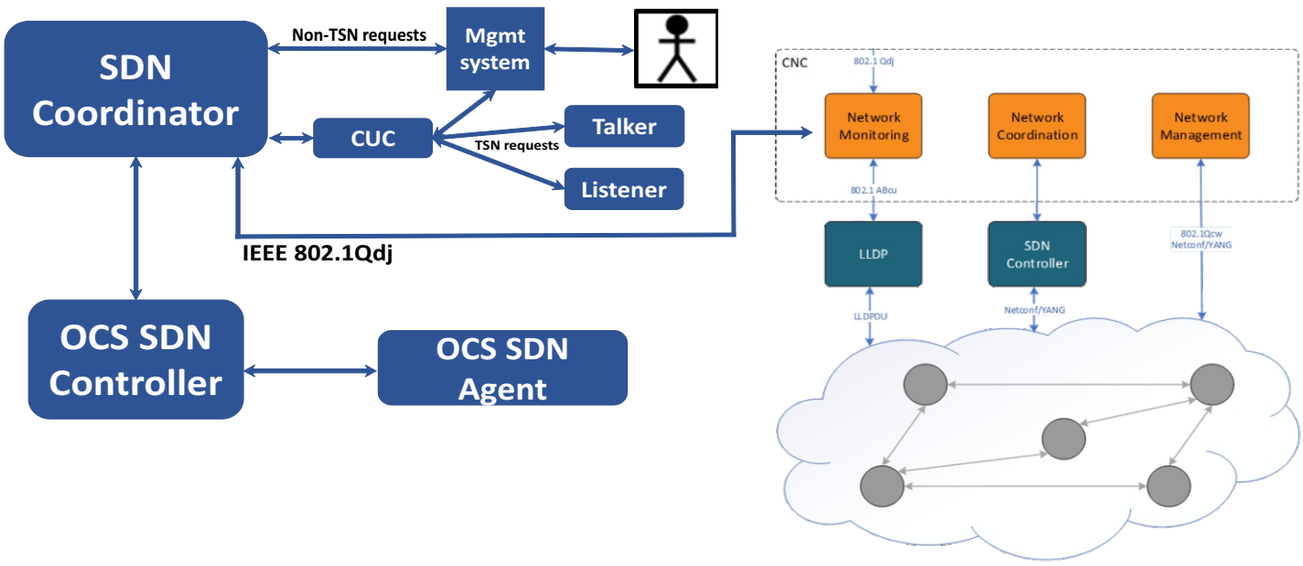
► The 1st generation of high-speed & low-power drivers are currently under design.

► The glass-based interposer diplexer 13xx-1550 nm was succesfully developed using a 2x2 direction coupler.

3 Development of Time Sensitive Network (TSN) Technologies and Integration with SDN Programmable Network Controller



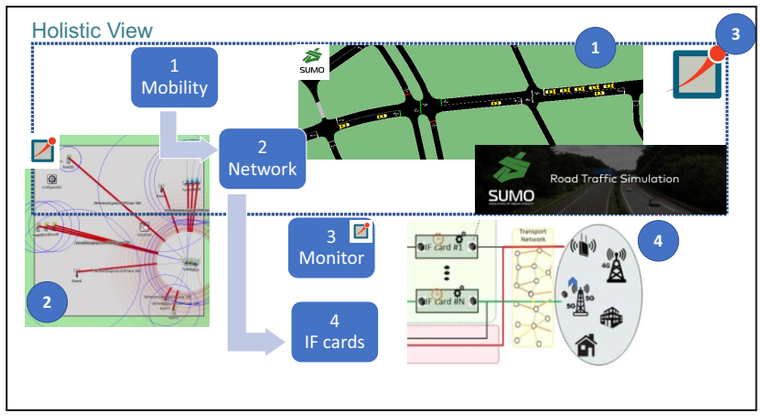
A simplified use/case example for load balancing of Time-Sensitive traffic classes where the SDN controller is monitoring and balancing the load among the switches to provide capacity and distributed load.

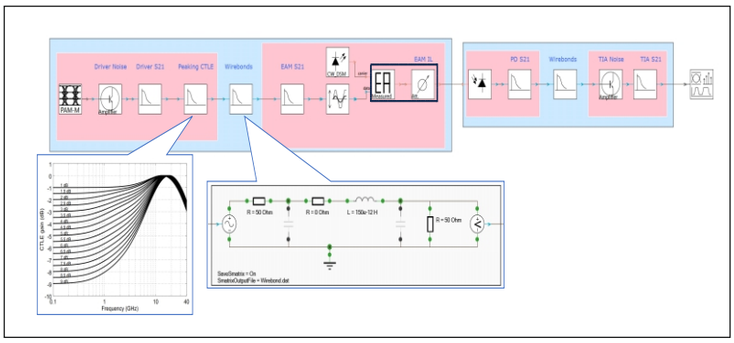


A schematic presentation of the proposed high-level TSN/SDN control plane functional architecture.

4 System & Component Modeling and Network Simulations

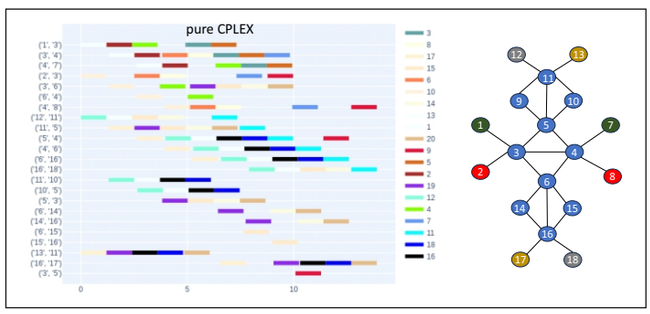
Modeling and simulation tools using the OMNET++ suite are under development to evaluate throughput, delay, jitter performance and examine different use cases.





An intra-NGCO link simulator has been set up in VPItransmissionMaker, aiming to provide insights for component/system design during the project.

Theoretical study and optimization-driven modeling to perform scalability study and formulate OCTAPUS-specific performance metrics.



Dissemination Activities

All dissemination activities can be found at:
http://octapus-ict.eu/index.php/dissemination/publications

- ✓ 2 Journal paper
- ✓ 13 Conferences
- ✓ 1 presentation at Standardization body/Organization
- ✓ 5 presentations at exhibitions
- ✓ 4 Other publications

PAST PRESENTATIONS

OCTAPUS at JNOG 2023 - Lyon, 5-7 July

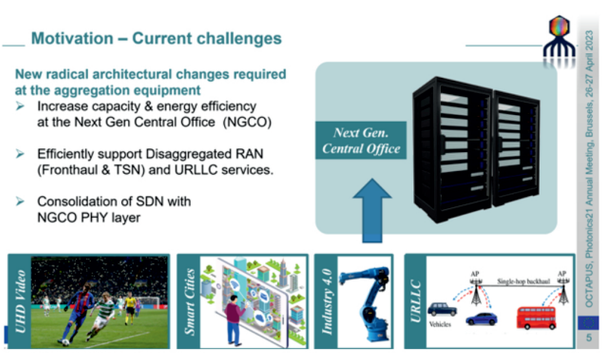




On July 5-7 the OCTAPUS project was presented in the French conference on Optical Communication, JNOG.

OCTAPUS at Photonics Partnership Annual Meeting - Brussels, 26-27 April

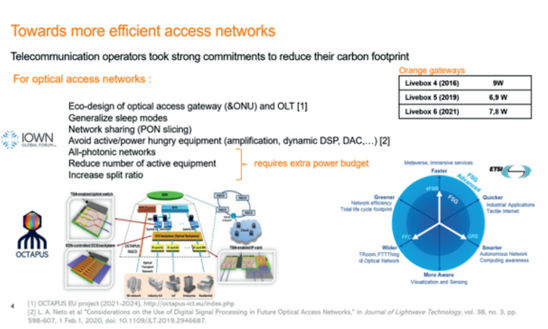




On April 26-27, the OCTAPUS project was presented at the Photonics Partnership Annual Meeting 2023 in Brussels by Dr. C. Vagionas as part of the Work Group 1 session, significantly contributing to the discussions and the roadmap of the Photonics21 PPP towards the future Digital Infrastructure.

OCTAPUS at OFC 2023 - San Diego, California , 5-9 March





On March 5, the OCTAPUS project was presented at the OFC Conference 2023, in a Workshop titled "Where are the Boundaries Between IM-DD and Coherent?".

UPCOMING PRESENTATIONS

ECOC 2023 – Glasgow UK, 1-5 October

"Reconfigurable Architecture for Point-to-Point Bidirectional Access Networks Allowing Multirate and Extended Reach", Georges Gaillard, Henrique Freire Santana, Fabienne Saliou, Nicola Calabretta, Philippe Chanclou, Luiz Anet Neto, Michel Morvan, Bruno Fracasso, ORAL PRESENTATION.

"Assessment of Training Patterns Performances in the context of Burst Mode equalization for 50G-PON", Gaël Simon, Fabienne Saliou, Jérémy Potet, Dylan Chevalier, Georges Gaillard, Philippe Chanclou, ORAL PRESENTATION.

"Triple Coexistence of G-PON, XGS-PON and 50G-PON Systems with Extended Reach", Fabienne Saliou, Gaël Simon, Stéphane Le Huérou, Guillaume Vu-Brugier, Ivan Cano, Derek Nesset, Ricardo Rosales, Jérémy Potet, Georges Gaillard, Dylan Chevalier, Joseph Zandueta, Giuseppe Talli, Philippe Chanclou, ORAL PRESENTATION.

"Investigation of Real-Time 25 Gbps Burst Mode Transmission over 20 km fiber with Directly Modulated Laser, Ge/Si APD Receiver and BM-TIA Targeting 50G-PON", Dylan Chevalier, Cheng Wang, Jérémy Potet, Gaël Simon, Gertjan Coudyzer, Georges Gaillard, Fabienne Saliou, Sofiane Belahsene, Constant Libs, Laurent Bramerie, Xin Yin, Philippe Chanclou, Pascal Scalart, Monique Thual, POSTER PRESENTATION.

"Sub-THz Fiber Wireless Multi-IFoF fronthaul of a V-band massive MIMO antenna for multi-user 6G networks", M. Vargemidou, P. Toumasis, K. Kanta, R. Maximidis, G. Giannoulis, Z. S. He, Y. Leiba, D. Apostolopoulos, H. Avramopoulos, A. Miliou, N. Pleros, C. Vagionas, ORAL PRESENTATION.

ECOC 2023 Workshop

F5G Optical Network Technologies towards 2025 and 2030 - What, Why and How?
Organized by ORANGE and Fabienne Saliou.

"Fixed-Mobile Convergence in F5G-Advanced", Invited presentation, Gaël Simon.

IEEE Globecom 2023- Kuala Lumpur, Malaysia, 4-8 December

"An Optimized Medium-Transparent MAC Protocol for Multi-service FiWi 5G transport networks", G. Kalfas, M. Gatzianas, D. Palianopoulos, A. Mesodiakaki, C. Vagionas, R. Maximidis, A. Miliou and N. Pleros.

OPEN DAY

50G-PON demonstration at Orange Open Tech Days – 28-30 November 2023, ORANGE.

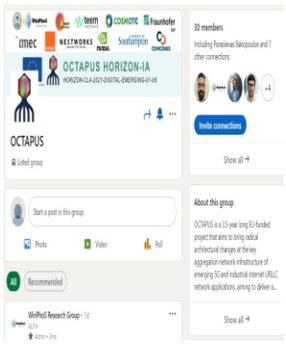
Communication Activities

Communication Channels

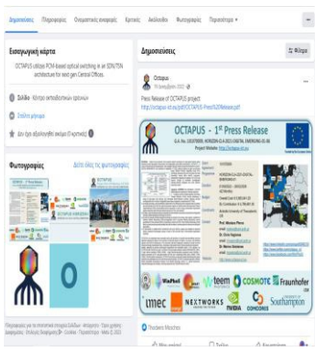
website



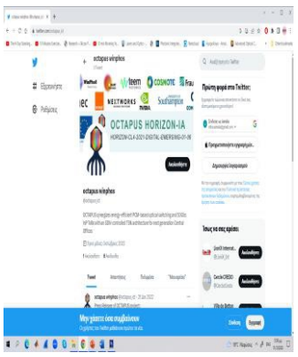
LinkedIn



Facebook



Twitter



Website (https://www.octapus-ict.eu)

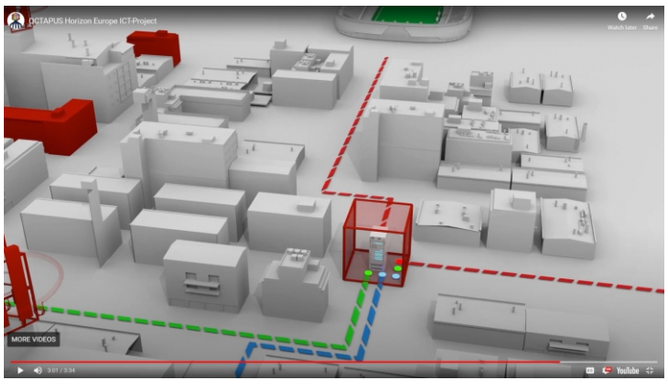
LinkedIn (https://www.linkedin.com/groups/9249210/)

Facebook (https://www.facebook.com/octapus.ict)

Twitter (https://www.twitter.com/octapus_ict)

OCTAPUS Video Presentation

The video presentation of the OCTAPUS project, which highlights the vision and objectives of the project has been realeased on YouTube. Watch it ***Here!*** or scan the QR code:



Consortium Meetings

M13 Consortium Meeting



The 3rd General Assembly meeting of the EU-funded project OCTAPUS took place on 12-13 of September 2023, organized by Fraunhofer IZM at the premises of FRAUNOFER Institute for Reliability and Microintegration IZM, Berlin, Germany. Representatives of the consortium had the chance to discuss he project's activities and plan the future actions towards the development on an Optical Circuit Switched Time Sensitive Network architecture for High-Speed Passive Optical Networks and next generation ultra-dynamic and reconfigurable Central Office environments.