A unified network, Computational and stOrage resource Management framework targeting end-to-end Performance optimization for secure 5G muLti-tEchnology and multi-Tenancy Environments

Consortium

MEET THE TEAM

13 partners	7 countries	5 Universities / Research Institutes	8 Companies	2 Telecom Operators

About 5G- Complete

5G-COMPLETE aims to revolutionize the 5G architecture, by efficiently combining compute and storage resource functionality over a unified ultra-high capacity converged digital/analog Fiber-Wireless (FiWi) Radio Access Network (RAN).

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Project Title: A unified network, Computational and stOrage resource Management framework targeting end-to-end Performance optimization for secure 5G muLti-tEchnology and multi-Tenancy Environments

Project Website: www.5Gcomplete.eu

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Duration: 01/11/2019 – 31/10/2022 (36 Months)

Partners: Institute of Communications and Computer Systems National Technical University of Athens (GR), Aristotelio Panepistimio Thessalonikis (GR), University of Bristol (UK), Siklu (IS), Institute of Accelerating Systems and Applications (IASA) (GR), IHP GMBH (GE), Nextworks (IT), Mellanox Technologies (IS), ADVA Optical Networking SE (GE), Nubificus (UK), COSMOTE (GR), ORANGE (FR), Accelleran (BE)

Grant Agreement no: 871900

Funding: H2020 ICT-20-2019-2020: 5G Long Term Evolution

EU Contribution: € 5 966 087.50

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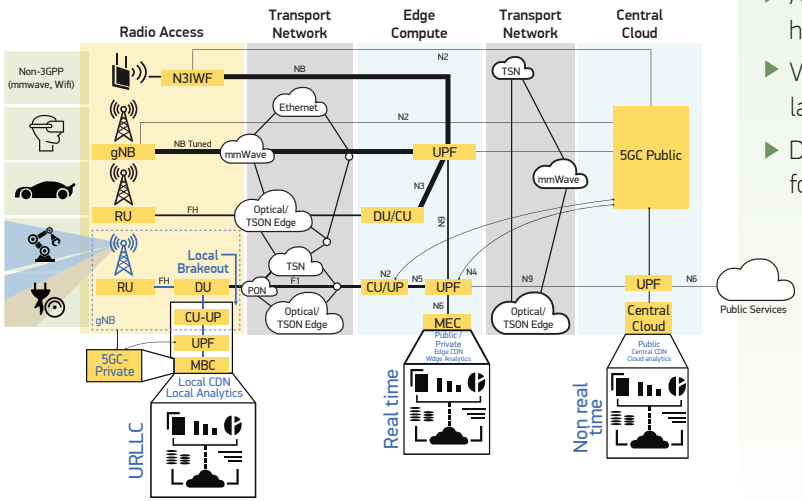
5G PPP
PUBLIC-PRIVATE PARTNERSHIP

The Vision

In accordance with the 5G vision, **5G-COMPLETE** aims to design and develop a converged infrastructure **integrating a variety of wireless network technologies with optical and packet transport network solutions in a common RAN layout**. This infrastructure will interconnect a variety of general and specific purpose compute / storage and network elements **applying the concepts of hardware programmability and network softwarization** to facilitate implementation of a set of different 5GNR deployment options. Aside from the transport network, **5G-COMPLETE** will build root of trust on each part of the Edge-Cloud continuum by establishing a secure and measured boot and by employing an attestation framework based on confidential containers. **5G-COMPLETE**'s architecture combines a series of key technologies under a unique architectural proposition that brings together:

- Time Sensitive Networking platform
- Network Slice Management
- Disaggregated and virtualized 5G RAN
- An attestation framework to verify the tasks deployed on Edge & the MEC node
- Hybrid transport solution multiplexing digital / analog optics
- mmWave mesh and THz radio node technologies
- DSP supporting large bandwidth baseband signals
- DSP engines supporting broad OOK optical connectivity
- suited for THz frequency band.



Project Objectives

Empowered by its ambitious vision, **5G-COMPLETE** aims to merge the Mobile Edge Computing (MEC) and Cloud complementary forces under a common flexible, profitable and energy-efficient RAN infrastructure, being able of synergistically exploiting Computing, Access and Storage services.

More specifically, **5G-COMPLETE** will:

- Develop a mmWave point-to-multipoint (PtMP) mesh node and an integrated THz transceiver
- Develop a delay time-sensitive and elastic optical bandwidth framework for converged network / computational / storage architectures
- Develop an advanced DSP platform to increase the bandwidth efficiency of edge optical transport layer
- Develop and demonstrate a toolbox of hardware and software solutions
- Develop joint network, computational and storage resource allocation optimization algorithms leveraging AI/ML techniques
- Deploy serverless computing paradigms at the edge for low latency services.
- Develop an end-to-end 5G network slicing management and orchestration framework
- Architect a low-latency, high energy efficiency, high-capacity and flexible 5G network
- Validate its 5G network technologies in a series of scalable lab-scale and field-trial demonstrators
- Deliver a holistic roadmap and business plan analysis for the cost-efficient and smooth

Technology Exploitation

5G-COMPLETE includes a coordinated set of actions towards the development of a flexible end-to-end 5G plug-and-play energy and resource efficient edge cloud network segment. It is a breakthrough concept that relies on the evolution of individual, well-established technologies and broadly accepted trends, thus offering the optimum balance of innovation and risk / maturity / time-to-market. 5G-COMPLETE's industry-driven consortium expands along the entire value chain and aims to foster the project's carefully selected set of innovations into tangible market outcomes. Driven by the end user needs, the project aims to combine Cloud and Edge computing functionality and place them on top of a unified ultra-high capacity converged digital/analog Fiber-Wireless RAN. The envisioned RAN target to satisfy per service flexible and versatile requirements and KPIs as dictated by specific stakeholders / applications / services and focus on demanding verticals, associated with:

- Smart energy metering deployment over the project's architecture
- 5G System over multi-domain transport infrastructure
- 5G Wireless Transport services with MEC capability provided to Nos
- Advanced Surveillance / Physical Security Services
- 5G Augmented Reality / Virtual Reality (AR/VR) Services