

Consortium



About Int5Gent

Int5Gent targets the integration of innovative data plane technology building blocks under a flexible 5G network resource, slice and application orchestration framework, providing a complete 5G system platform for the validation of advance 5G services and IoT solutions.



Int5Gent

Integrating 5G enabling technologies in a holistic service to physical layer 5G system platform



Project Title: Integrating 5G enabling technologies in a holistic service to physical layer 5G system platform

Project Website: www.int5gent.eu

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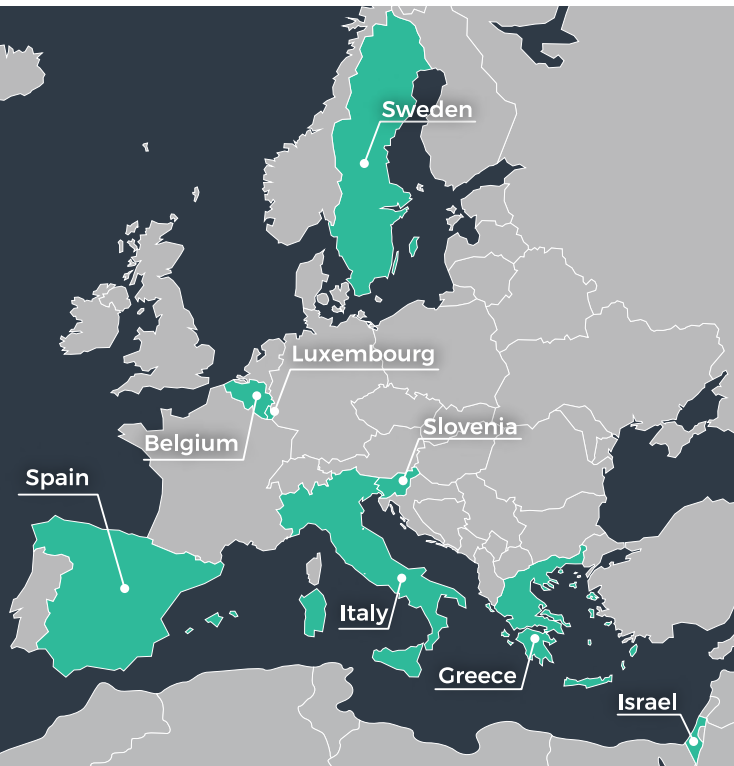
Duration: 01/11/2020 – 31/10/2023 (36 Months)

Partners: Institute of Communications and Computer Systems National Technical University of Athens (GR), Mellanox Technologies LTD - MLNX (IS), Netcompany-Intrasoft SA (LU), Telefónica Investigación y Desarrollo SA (ES), Universidad Carlos III de Madrid (ES), COSMOTE Kinites Tilepikoinonies AE (GR), UBITECH (GR), SIKLU Communications LTD (IS), SINOWAVE AB (SE), NEXTWORKS (IT), INTERNET INSTITUTE | Communications solutions and consulting LTD (SI), WORLDSSENSING SL (ES), IMEC (BE), Aristotle University of Thessaloniki (AUTH) (GR), Centre Tecnologic de Telecomunicacions de Catalunya (ES), Ferrocarrils de la Generalitat de Catalunya (ES)

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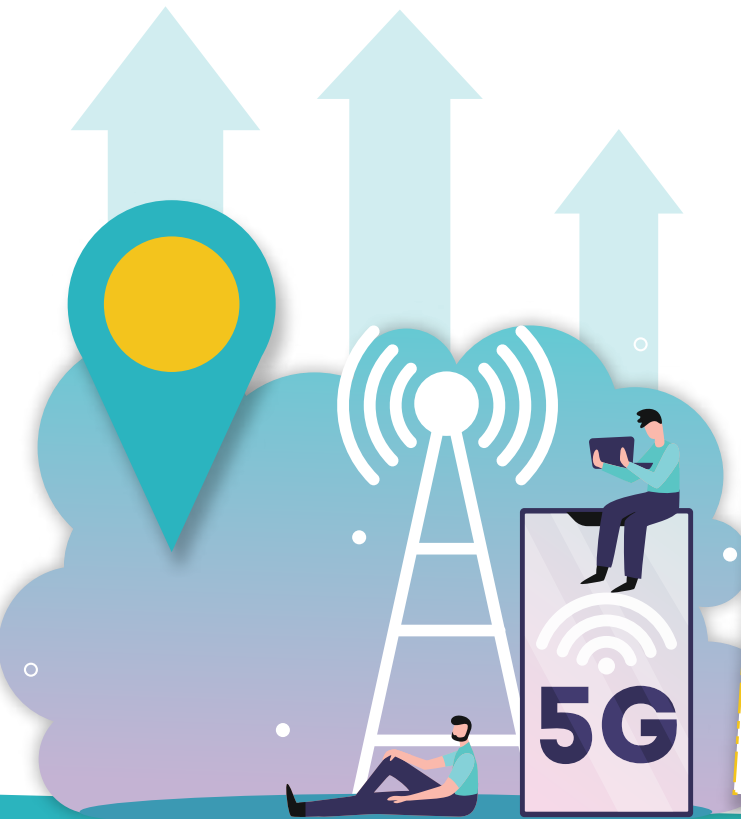


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The Vision

Int5Gent aims to deploy a **holistic 5G system platform** that **combines new technological blocks for the data plane infrastructure** orchestrated by flexible PNF-VNF instances over a generalized NFV Infrastructure (NFVI) that is extended to edge computational, storage and networking resources. An overlay application orchestrator for the vertical services allow a pragmatic approach for the services' deployment, the extraction of analytics and the inclusion of policy criteria. **The overall goal is to integrate innovative solutions at different development layer of the 5G stack and combine them optimally in the quest to promote true 5G enabling solutions for new technology and service provisioning vertical markets.**



Project Objectives

Int5Gent aims to seamlessly interconnect access nodes supporting any type of IoT device and related services over a bandwidth flexible and adaptive fronthaul/backhaul infrastructure and control and manage the network and computational resources, as well as orchestrate the lifecycle of the deployed service functions.

More specifically, Int5Gent will:

- ▶ Develop a mmWave point-to-multipoint (PtMP) mesh node to enhance the connectivity of IoT devices in support of low-latency computing at the edge
- ▶ Develop D-band 5G Terminal Nodes supporting flexible co-packaged electro-optics interfaces for practically unlimited fronthaul/backhaul transport capacities
- ▶ Develop a multi-stream bit-interleaved sigma-delta modulated interface for bandwidth-efficient, low-power interconnection between edge box and frequency agnostic 5G RRH nodes
- ▶ Edge-Box deployment based on advanced baseband processor platforms for MEC-oriented use cases
- ▶ Architect a truly flexible 5G C-RAN with reconfigurable optical fronthaul interfaces and "on-demand" optical bandwidth-capacity steering functionalities
- ▶ Dynamic application driven orchestration of network slices in distributed 5G infrastructures with edge-fog computing capabilities
- ▶ Develop an end-to-end 5G network slicing management and orchestration framework to dynamically reconfigure a multi-technology network at service runtime.
- ▶ Validate 5G technological blocks in a series of scalable lab-and field-trial demonstrators targeting service-oriented use cases.
- ▶ Deliver a holistic roadmap for transforming Int5Gent innovations into business opportunities with strong 5G market potential

Technology Exploitation

Int5Gent targets the integration of innovative data plane technology building blocks under a flexible 5G network resource, slice and application orchestration framework, providing a complete 5G system platform for the validation of advance 5G services and IoT solutions.

The project builds upon a suite of innovative 5G technological solutions spanning hardware, software, and networking systems that have been conceptualized and developed under the latest 5GPPP initiative projects and are now taken to TRL-7 and above. It also combines novel and state-of-the-art solutions able to further upgrade the capabilities and maturity level of cutting-edge 5G core technologies enabling the creation of an innovative 5G ecosystem. A sample of the developed and offered technologies include flexible multi-RAT baseband signal processing, beam steering, mmWave technology solutions at 60GHz and 150GHz bands, hardware-based edge processor with TSN, GPU processing capabilities, innovative 5G terminals and elastic SDN-based photonic data transport. The integration of the technology blocks is performed as part of an overall 5G architecture that promotes edge processing and is orchestrated by an NFVO compatible framework with edge node extensions at the network layer and an overlay vertical services application orchestrator at the user plane layer.

The overall platform is implemented in two extended testbeds which include actual field deployed segments and managed by the network operators of the consortium. The validation and showcasing testbeds host 3 use case scenarios covering the deployment of services related to multiple vertical sectors as well as innovative applications for smart IoT networked devices. The use cases are designed in order to highlight the benefits of the adopted technologies in terms of increased bandwidth, low latency and high reliability and create new markets opportunities especially for the participating SMEs through pilot validation of their offered solution.