Optimized 6G-enabled IoT Networks for Unlicensed Operations in the Computing Continuum

OPTIMUS-6G Project Overview

HORIZON-SNS-2025-STREAM-B-01-02: Advanced IoT and Device Technologies

Duration: 1/7/2026-30/6/2029, Budget: € 3.197.300 Total (€2.999.650 EU)

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Foundation for Research and Techology - Hellas (FORTH)



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Scope and Objectives

Scope: **Develop** and **validate** an AI-enabled, **Digital Twin-driven multi-domain 6G-U architecture** that enables seamless **unlicensed operations, multi-band communication**, and **optimized** operation of heterogeneous **IoT devices** across radio, optical, edge, and cloud **environments**.

Objective 1: Design a **multi-band, multi-RAT 6G IoT architecture** for reliable, low-latency unlicensed operations

Objective 2: Implement **AI-driven orchestration** for optimized communication, resource allocation, and energy efficiency

Objective 3: Develop a **6G-enabled Digital Twin framework** for network planning, simulation, and optimization

Objective 4: Validate the **framework** across **diverse IoT use cases** and service requirements

Objective 5: Maximize impact through **business, dissemination, exploitation, and standardization** activities

Consortium



Research Institutes
- Foundation for Research and Technology – Hellas (FORTH)
- Interuniversity Microelectronics Centre (IMEC)
- Luxembourg Institute of Science and Technology (LIST)

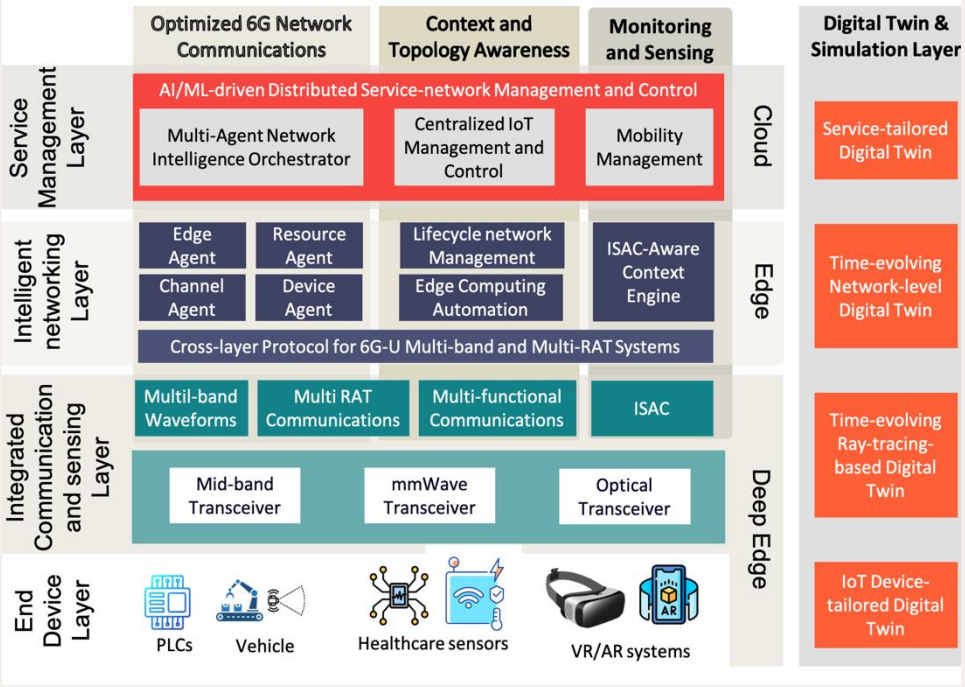
Industrial Partners
- Intracom Telecom SA (ICOM)
- Siemens AG (SAG)

Small and Medium Enterprises
- Innocube I.K.E. (INNO)
- Hyperion Technologies (HYPER)
- Artemis Rtd (ARTM)

5 EU Members (Greece, Belgium, Luxemburg, Romania, Germany)
1 partner from an associated country (Turkey)

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Architectural Framework



Key Enablers

- Multi-band and multi-RAT communications
- Radio and optical transceivers
- Integrated sensing and communication in the IoT
- Cross-layer protocol for 6G-U
- AI/ML-driven distributed service-network management
- Context and topology-aware generative models for IoT
- Digital twin assisted network monitoring and planning

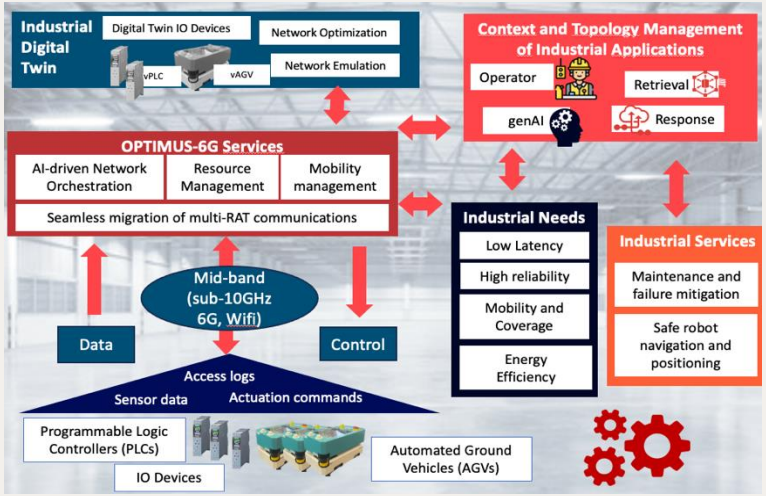
Pillar I: Multi-band communication and sensing in unlicensed bands

Pillar II: Energy efficient optimization of communications and data processes

Pillar III: Digital twin assisted framework for network enabled monitoring and planner

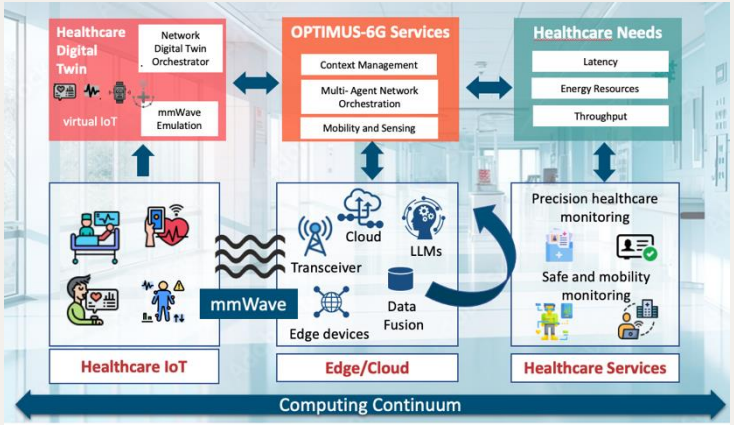
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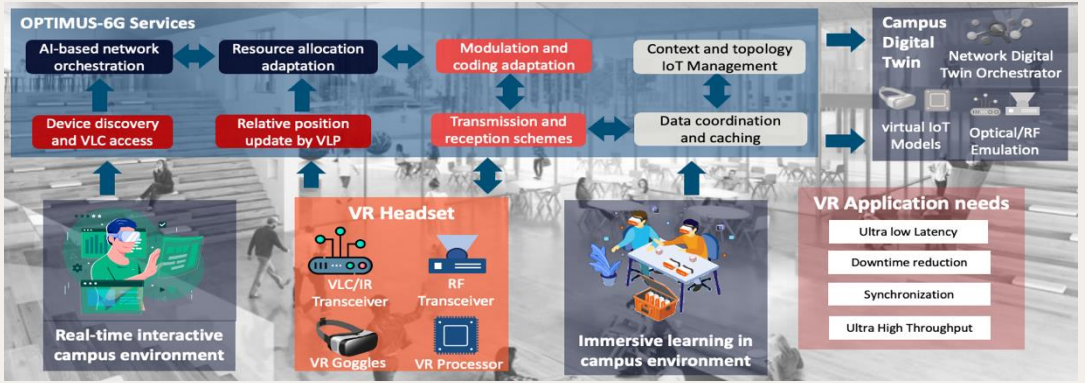
Use Cases



Use Case 1 - Process automation and robotic operations in smart factories

Use Case 2 - Human monitoring for precision healthcare and safe navigation





Use Case 3 - Immersive virtual reality in Campus Networks

Thank you



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www.optimus-6g.eu optimus-6g

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