

6GXR

6G-XR Project Overview

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www.6g-xr.eu

6G-XR Project Overview



Full name: 6G eXperimental Research infrastructure to enable next-generation XR services

Stream: Horizon Europe – SNS JU Phase 1 Stream C – SNS Experimental Infrastructures

Project Coordinator: Dr Jussi Haapola, *University of Oulu*
Technical Manager: Dr Mohammed Al-Rawi, *IT*

Objective: Strengthen European leadership in 6G technologies by enabling **next-generation XR services and infrastructures** that will provide beyond-state-of-the-art capabilities **towards the 6G era**

 **15**
partners

 **8**
countries

 **36**
months

Consortium



Build a multisite Research Infrastructure (RI) that can provide validation platform for multitude of foreseen (extreme) 6G use cases by developing enablers for networking and computing, radio access technologies beyond 5G, enablers for XR services with in-build federation, trial management, abstraction tools as well as energy measurement framework

Validate multi-access edge computing scenarios and their integration into a complete cloud continuum, support innovative use cases with vertical actors, beyond 5G capabilities, and support showcasing events

Demonstrate and validate performance of innovative 6G applications with a focus on demanding immersive applications such as holographic communications, digital twins and XR/VR

South Node



Real-time Holographic Communications

UC1: Resolution Adaptation or Quality on Demand

- Detect cell congestions and adapt XR resolutions or XR traffic priority

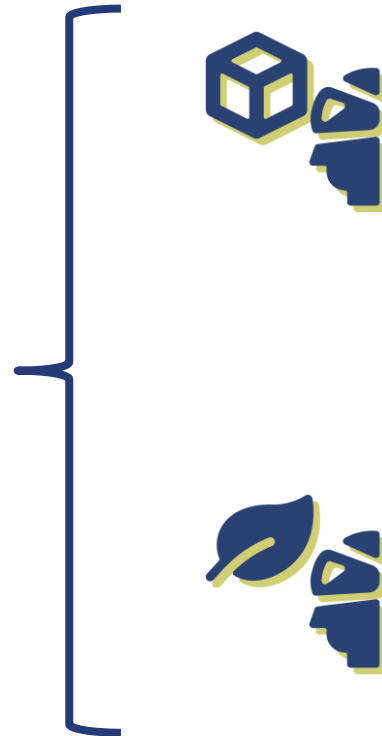
UC2: Routing to the Best Edge

- Select and make use of the most appropriate Edge based on specific goals

UC3: Control Plane Optimizations

- Integrate holographic communications to the network control plane

North Node



Digital Twins

UC4: Collaborative 3D Digital Twin-like Environment

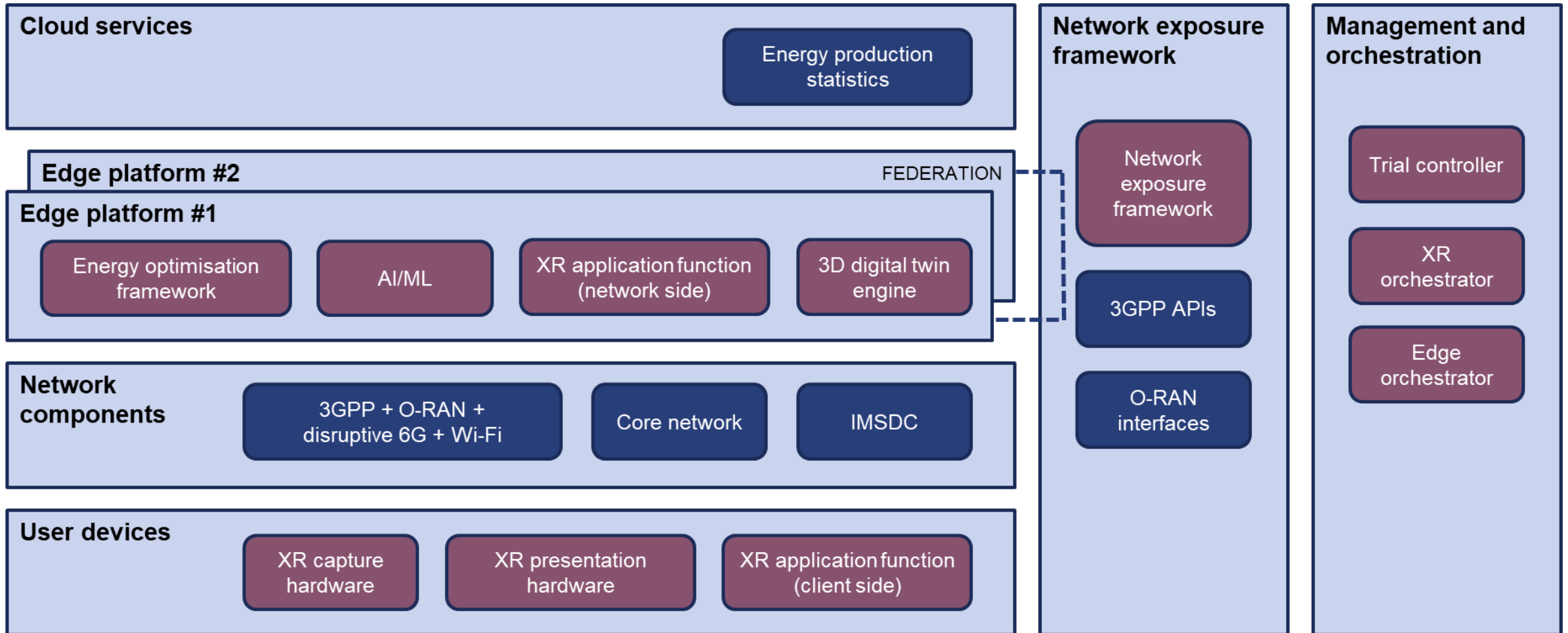
- Enable real-time collaboration and control of physical assets in virtual reality

Energy Consumption

UC5: Energy Measurement Framework for Energy Sustainability

- Measure and optimise end-to-end energy consumption in mobile networks

6G-XR Reference Architecture Overview [6G-XR D1.2]



User devices:

- Developing hardware and methods for 3D volumetric video capture
- Experimenting with variety of XR presentation devices
- Developing client software for holographic communications

Network components:

- Developing and experimenting with XR-related RAN enhancements for 3GPP, O-RAN, disruptive 6G, and Wi-Fi technologies
- Developing and experimenting with XR-related core network enhancements for user and control plane

Edge platform:

- Developing methods for end-to-end energy measurement and optimization
- Developing AI/ML algorithms for RAN resource management
- Developing edge processing solutions for XR applications and services

Cloud services:

- Integrating external open data into the network management processes

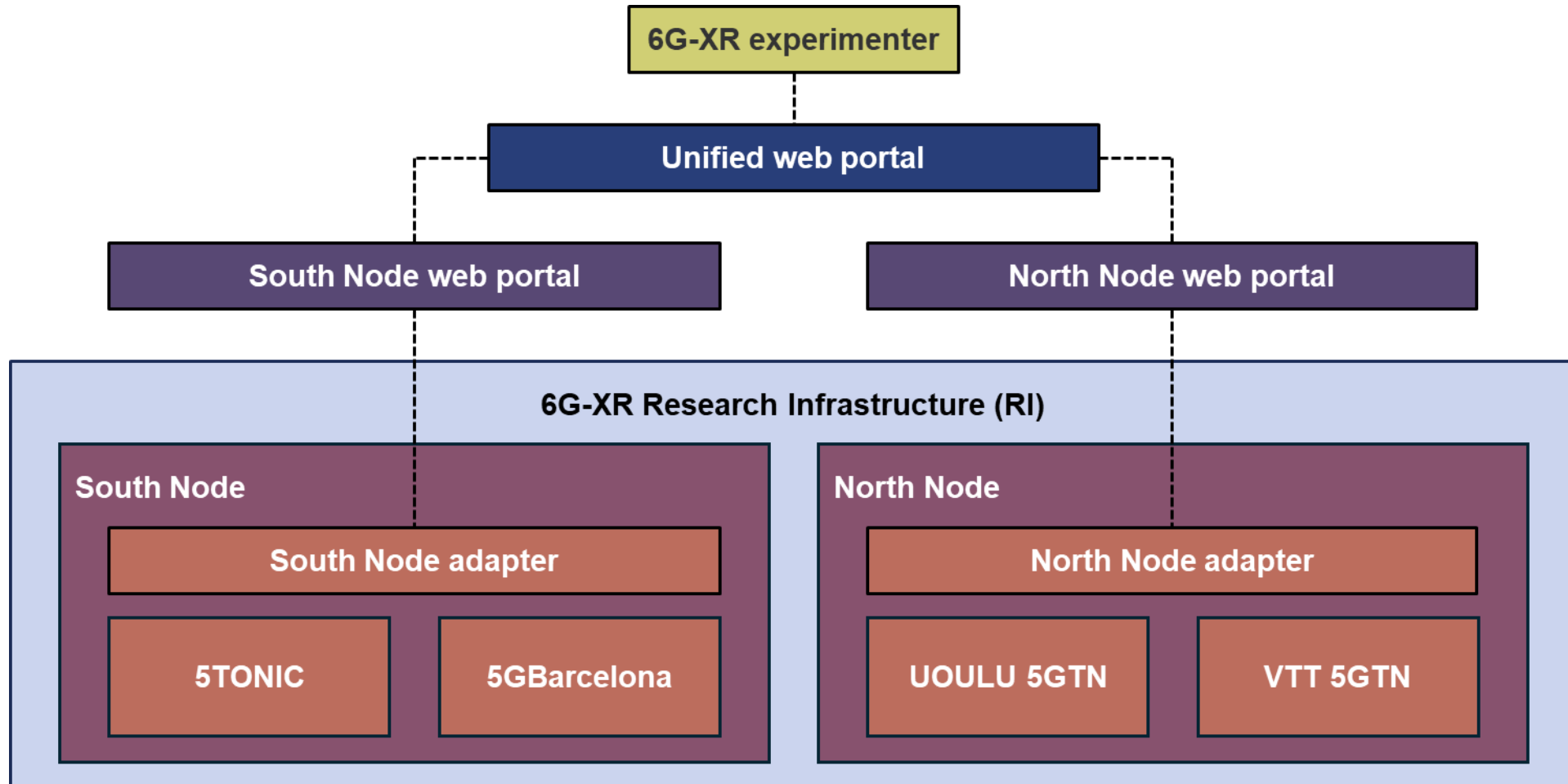
Management and orchestration:

- Developing remote experimentation enablers
- Developing XR application session orchestration capabilities
- Developing edge platform resource orchestration and federation capabilities

Network exposure framework:

- Developing open APIs (CAMARA) for network resource and capability exposure
- Experimenting with standardized 3GPP APIs for network resource and capability exposure
- Developing and experimenting with O-RAN interfaces and xApps for RAN resource monitoring and control

Overall Research Infrastructure [6G-XR D1.3]

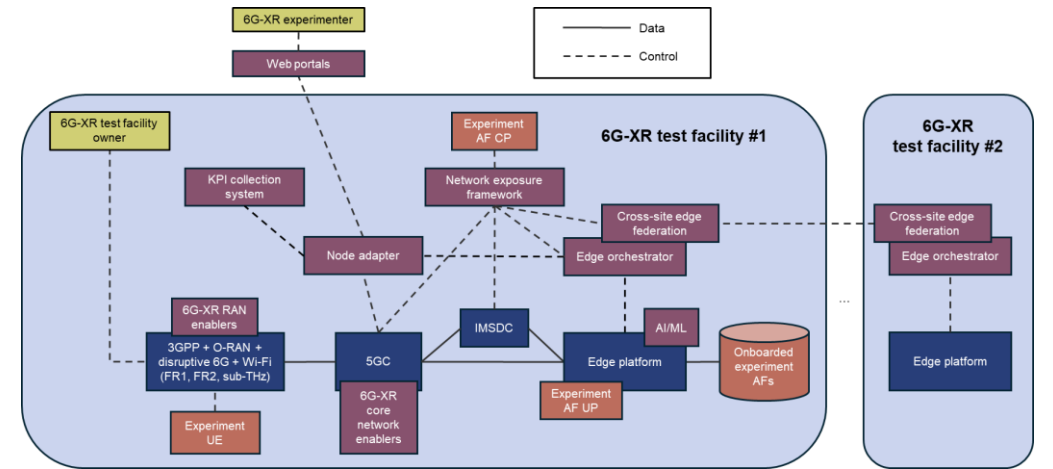


Architecture Deployment [6G-XR D1.3]



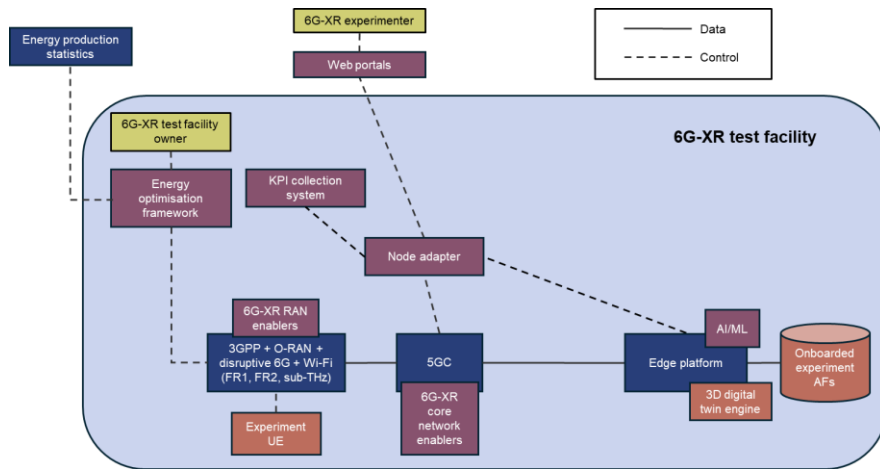
Key architecture enablers deployed at the **South Node** experimental site in Spain:

- RAN and core network enhancements
- Edge processing, orchestration, and federation
- Open and standardized network resource and capability exposure APIs



Key architecture enablers deployed at the **North Node** experimental site in Finland:

- RAN and core network enhancements
- 3D digital twin engine for real-time VR collaboration
- End-to-end energy measurement and optimization



Total budget: 1.845.000 EUR for Financial Support to Third Parties (FSTP) - 60 k€ per grant

6G-XR OC1 (2023):

- **6G-XR platform and network enablers** targeting development and extension of the 4 research infrastructures: i) Networking and Computing enablers; ii) XR enablers; iii) RAN enablers; iv) Sustainability enablers
 - 8 projects finalised
 - Results available at <https://www.6g-xr.eu/open-calls/oc1-results/>

6G-XR OC2 (2024):

- **Stream B enablers** targeting the accepted Stream B projects with potential topics related to system architecture, wireless communication technologies, signal processing, communication infrastructure technologies and devices
 - 10 projects selected for implementation and ongoing

6G-XR OC3 (2025):

- **Vertical replicability enablers** to allow third-party agents to leverage 6G-XR's enablers, infrastructure facilities and testbeds to deploy, replicate and validate the verticals of their interest
 - More information coming in October-November 2024
 - Call for proposals opening towards the end of 2024
 - 12 projects to be selected for implementation
 - Stay tuned!

6G-XR Open Calls website:

<https://www.6g-xr.eu/open-calls/>

[6G-XR D1.1] 6G-XR, "Requirements and use case specifications," Deliverable D1.1, Sep. 2023.

[6G-XR D1.2] 6G-XR, "Reference architecture description," Deliverable D1.2, Jun. 2024.

[6G-XR D1.3] 6G-XR, "Test infrastructure specification," Deliverable D1.3, Jun. 2024.

DEMO IN THE LOBBY!

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Thanks



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6G SNS

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