

Enabling Vertical Services with a Cross-Domain 6G Architecture and Trial Framework

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Motivation

- Validating **6G technologies** and **vertical applications** in realistic operating conditions is essential for their credibility and adoption
- Network exposure and analytics capabilities largely missing in European pilot sites, limiting vertical services
- To mitigate this, AMAZING-6G (Figure 1) offers Compute-as-a-Service (CaaS), Network Slicing-as-a-Service (NSaaS), AI-as-a-Service (AlaaS), and energy-efficient Internet-of-Things (IoT) support using Reduced Capability (RedCap)

AMAZING-6G Trial Framework

- End-to-end **compute** and **networking** continuum with **AlaaS** and **IoT** capabilities
- Functional Groups (FGs) and Functional Components (FCs, not shown) as a **blueprint** for implementing the B5G/6G technologies in various trial sites (Figure 2)
- B5G/6G technologies**: intelligent network orchestration, dynamic network slicing, Non-Terrestrial Network (NTN) integration, CAMARA APIs, MLOps, RedCap, etc.

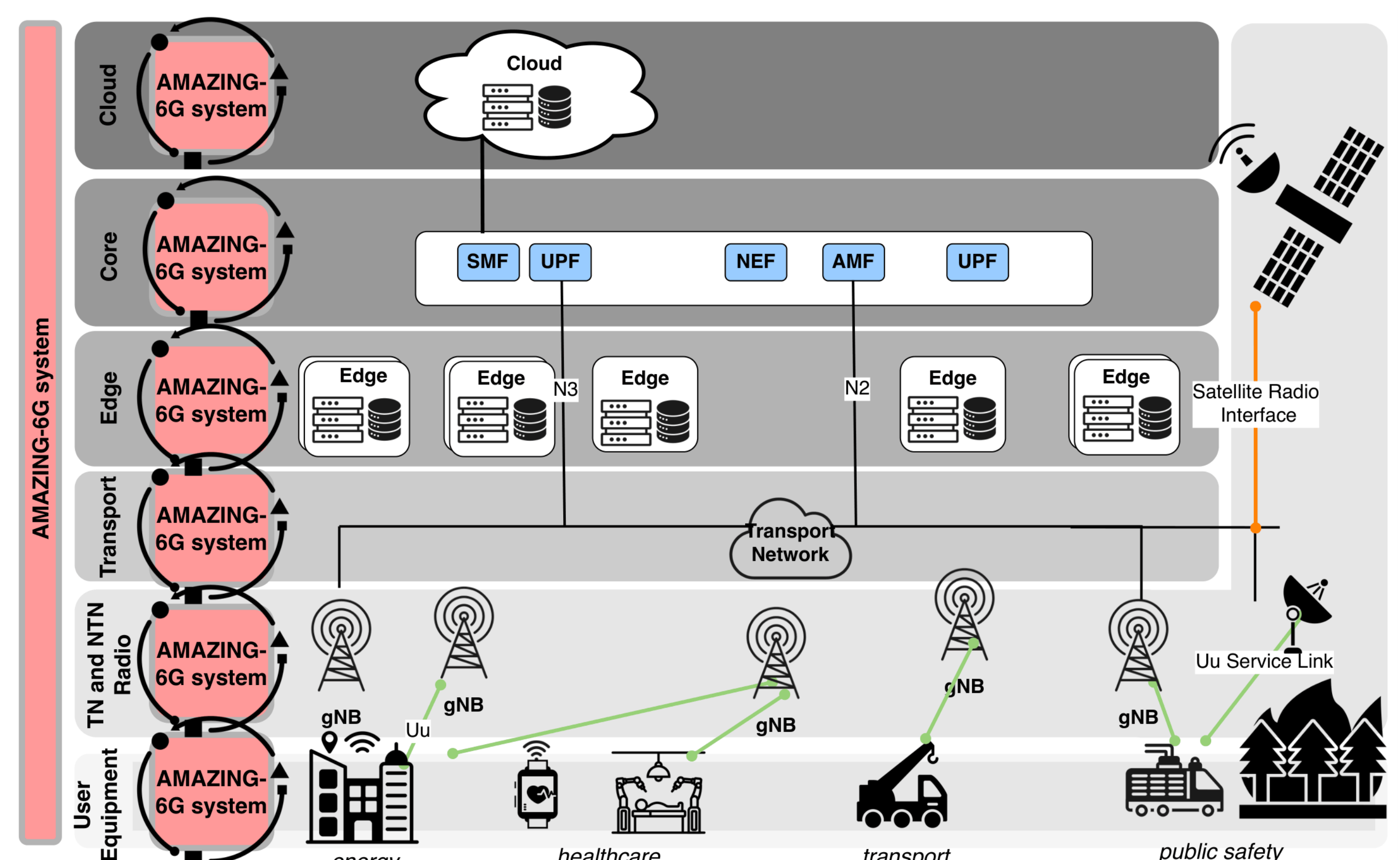


Figure 1. AMAZING-6G ecosystem.

Vertical sectors and a subset of use cases

- Healthcare**: 6G-enabled patch-based cardiac ultrasound assessment for diagnosis/intervention/patient follow-up
- Public safety**: TN-NTN support for AR/VR-assisted Control Centres for emergency operations
- Energy**: Joint optimization of energy consumption and user comfort in smart buildings and Renewable Energy Communities (RECs) using B5G/6G, edge-cloud computing, and distributed AI
- Transport**: Edge-based digital twins and B5G/6G connectivity for supporting Vulnerable Road Users (VRUs)

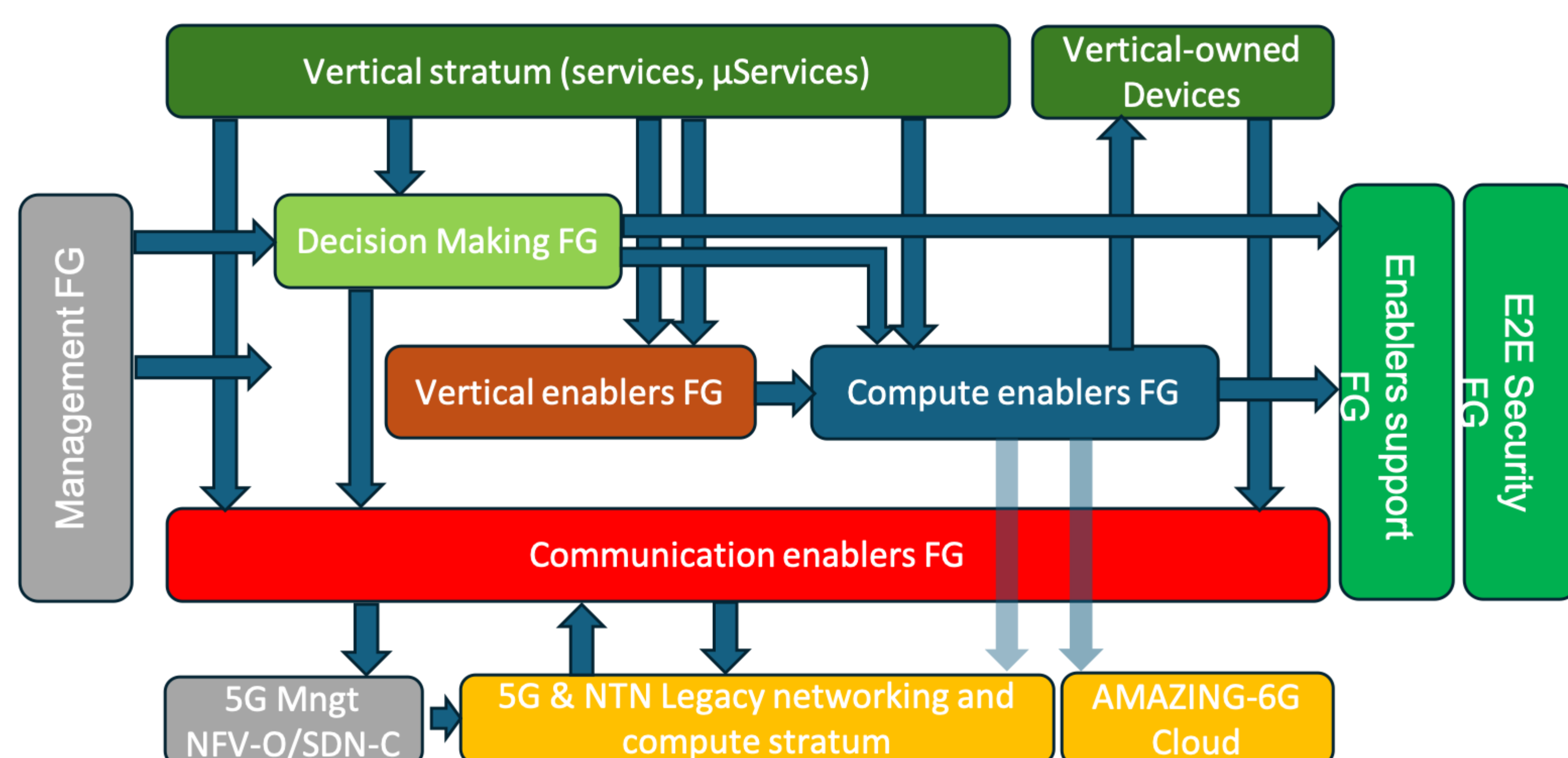


Figure 2. High-level view on the AMAZING-6G trial framework FGs.

Future outlook on 6G for verticals

- Joint optimization of latency, reliability, and energy efficiency is essential for vertical services
- Possible solutions:
 - CaaS and NSaaS as key strategies to achieve dynamic network slicing and intelligent service orchestration,
 - Large-scale trialing, massive data collection, AlaaS