European View on 6G

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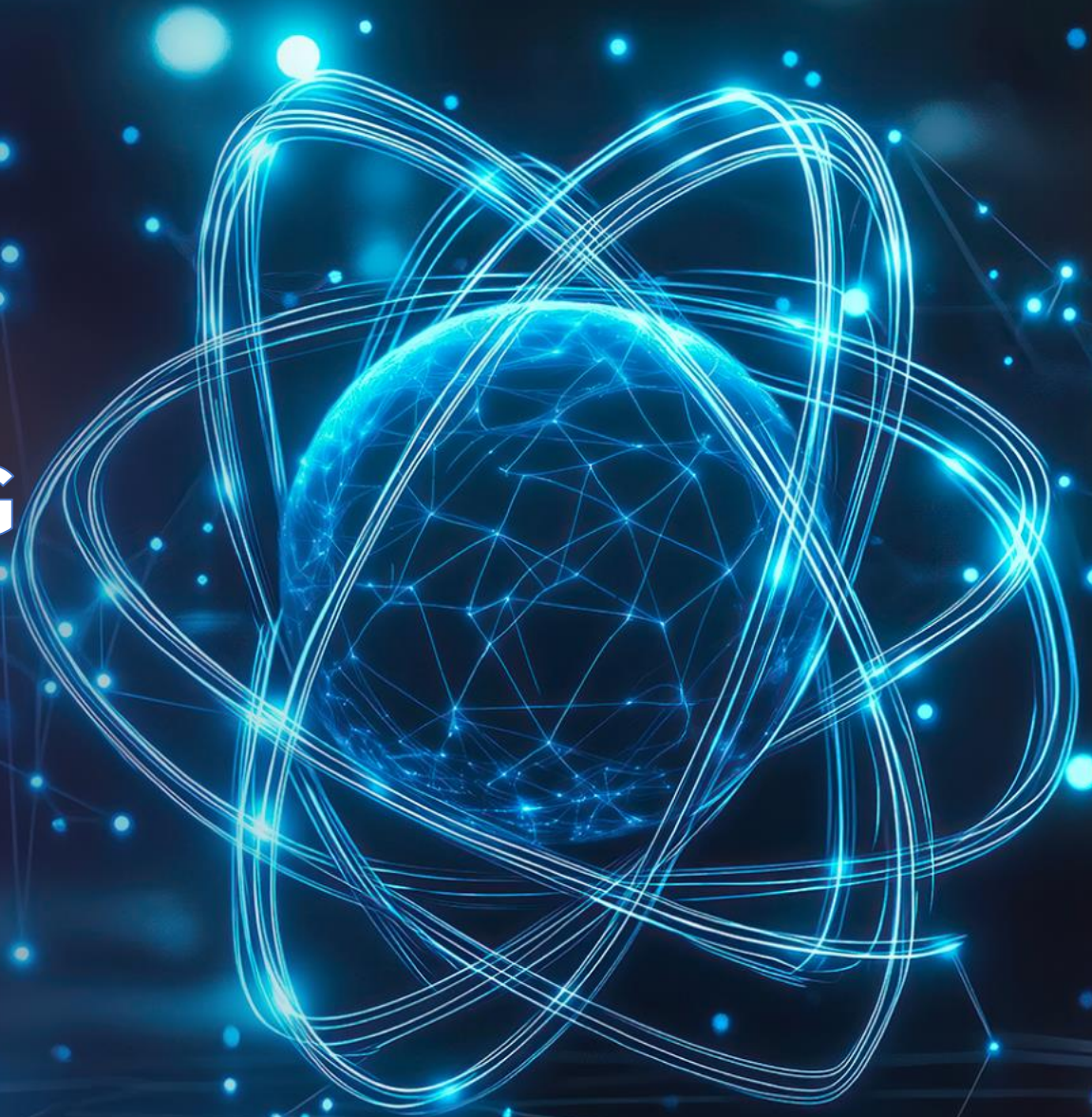
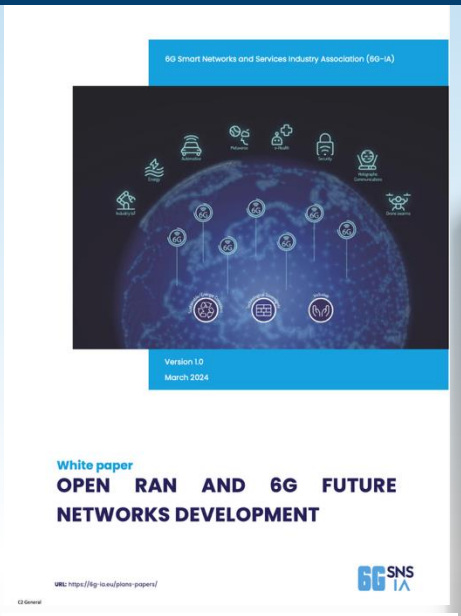
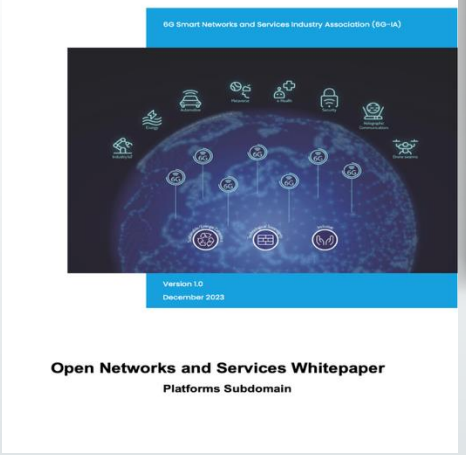
The Voice of European Industry and Research for Next Generation Networks and Services



European Vision & Strategy for 6G networks





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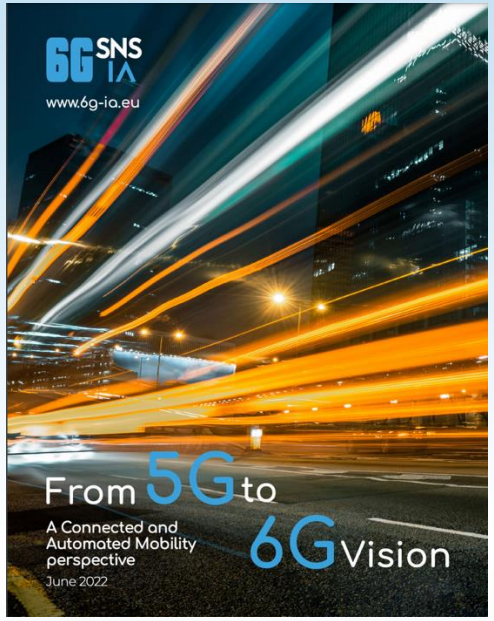

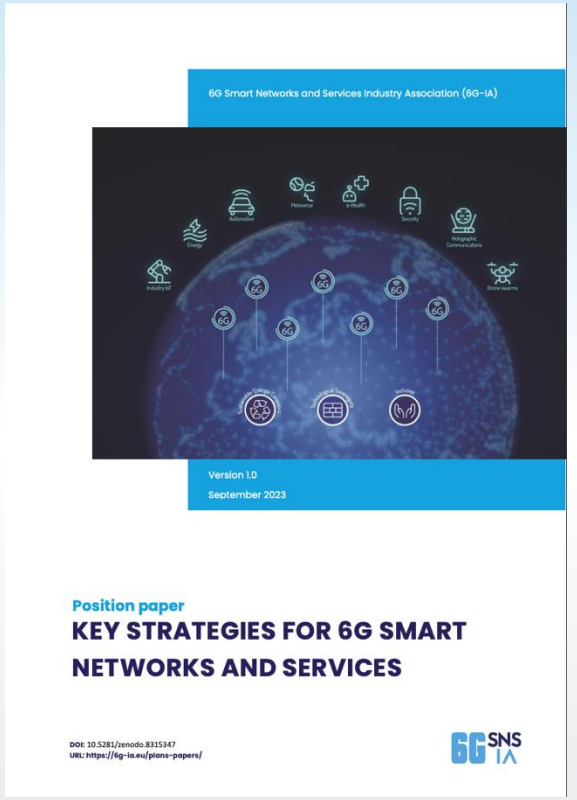

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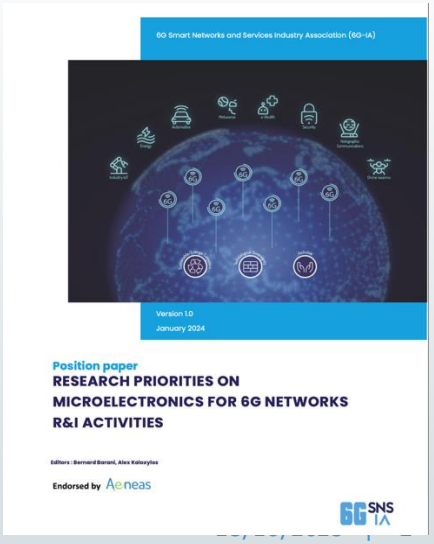


More than 40 white papers. All of them are publicly available at https://6g-ia.eu/plans-papers/

6GSNS | European 6G Usecase Families

Work Items to meet the IMT-2030 targets

INTEGRATED SENSING AND COMMUNICATION

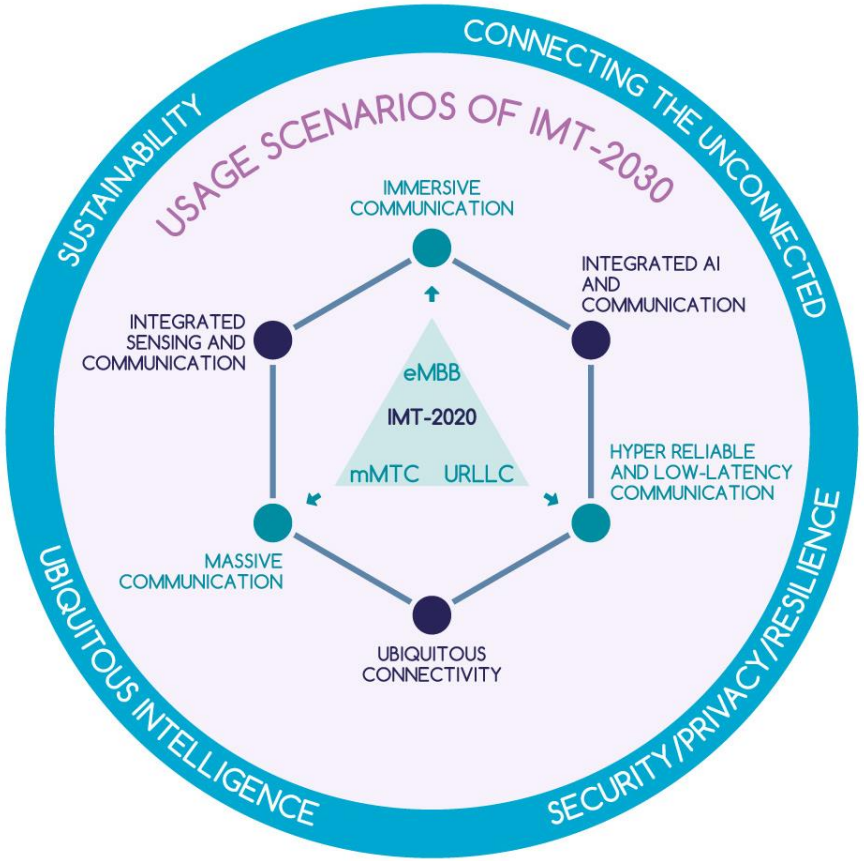
- Distributed sensing services
- Compact & Complete Data Representation
- Sensing control functions
- Continuity of sensing service
- mmWave spectrum blocking
- ISAC functionalities distribution across network elements
- Waveform and signalling optimization
- Deployment limitations (cost, power, size)
- Object/Target Management Function

INTEGRATED AI AND COMMUNICATION

- Data-driven Architecture
- AI model trustworthiness
- Intelligence at the edge
- AI framework & conflict management
- AI for RAN energy efficiency
- Self-evolving autonomous systems

UBIQUITOUS CONNECTIVITY

- Global, Open Service APIs
- Trust models
- Integration with NTN
- Integration of AI-solutions
- Federation
- User-centric approach
- Management plane centralization



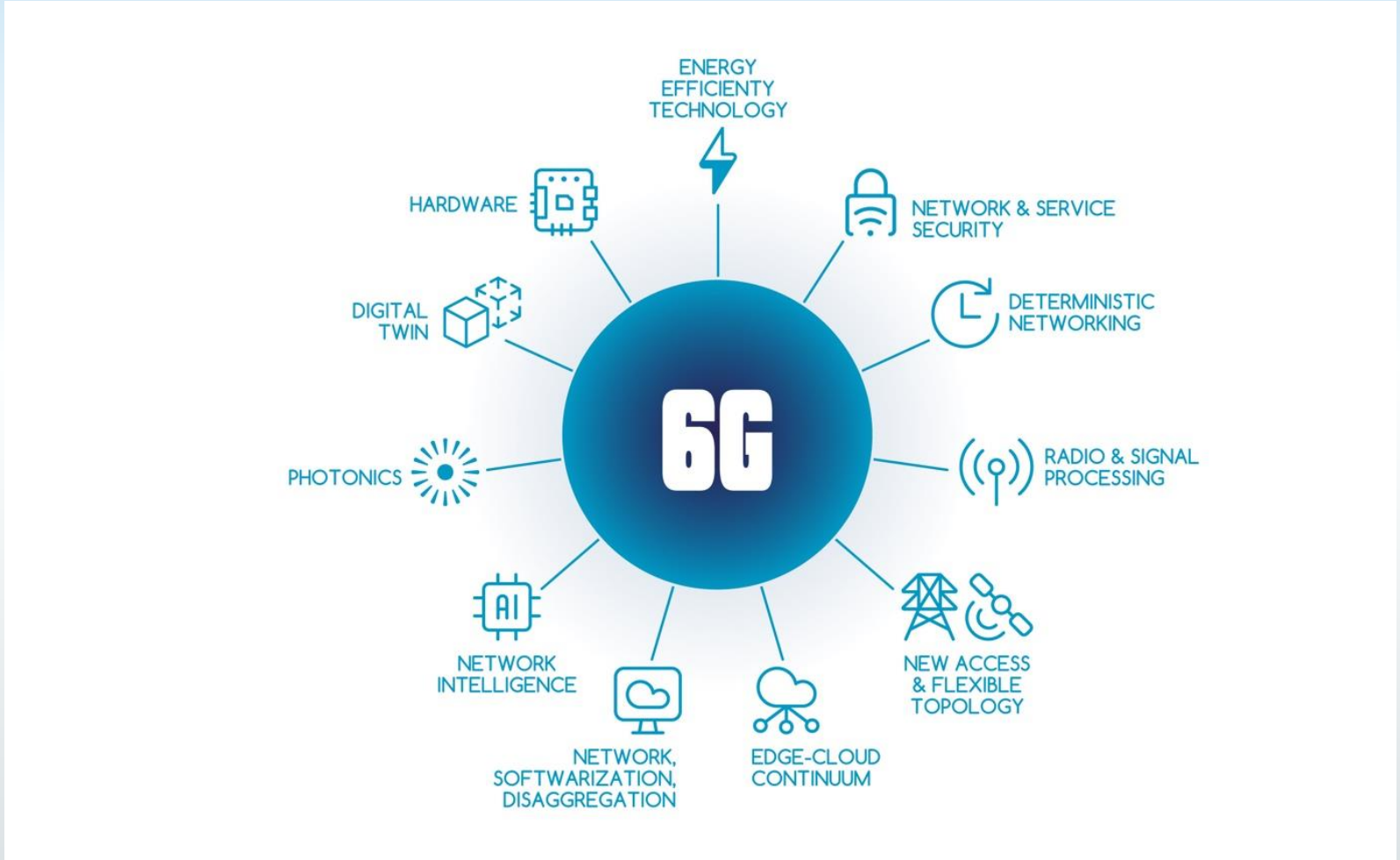
IMMERSIVE COMMUNICATION
HYPER RELIABLE AND LOW-LATENCY COMMUNICATION
MASSIVE COMMUNICATION

- Flexible Service-Centric Design
- Minimized MIMO Processing Complexity,
- Efficient Orchestration (of Orchestrators)
- Energy-Efficient RAN
- Excellent Interoperability of RAN Components
- Integration of Localized Networks
- Optimization of Control Plane Signalling
- Alignment of Network Intelligence with network infrastructure
- Seamless Connectivity
- Quantum-Resilient Security
- Sustainable RAN Virtualization
- Reconfigurable Multi-Connectivity
- Optimization of RU Energy Consumption
- Programmable Transport

6G Use cases in focus around the world

6G Use Cases	Networld Europe SRIA 2022	5G Americas / Next G Alliance	Huawei (China)	B5G Consortium (Japan)	TSDSI (India)	MediaTek (Taiwan)	Survey Paper	ITU IMT-2030
Holographic Communications	✓	✓	✓	✓	✓	✓	✓	✓
Cyber-Physical Systems, DT, Manufacturing	✓	✓	✓	✓	✓	✓	✓	✓
Multi-Sensory extended Reality (XR), Gaming/Entertainment	✓	✓	✓	✓	✓	✓	✓	✓
Tactile/Haptic Communications	✓	✓	✓	✓	✓	✓		✓
Medical/Health Vertical, Telesurgery	✓	✓	✓	✓	✓	✓	✓	
Cooperative Operation among a Group of Service Robots / drones	✓	✓	✓	✓	✓		✓	✓
Imaging and Sensing	✓	✓	✓	✓	✓			✓
Transportation Vertical (automotive, logistics, aerial, marine, etc.)	✓	✓	✓	✓	✓		✓	
Space-Terrestrial integrated network	✓	✓		✓	✓		✓	✓
Intelligent Operation Network	✓		✓		✓		✓	✓
Critical Infra, Government/National Security	✓	✓		✓				
First Responder/Emergency Services		✓		✓	✓			
Smart Buildings			✓	✓	✓			
Agriculture / Smart Farming				✓	✓			

6G technology enablers

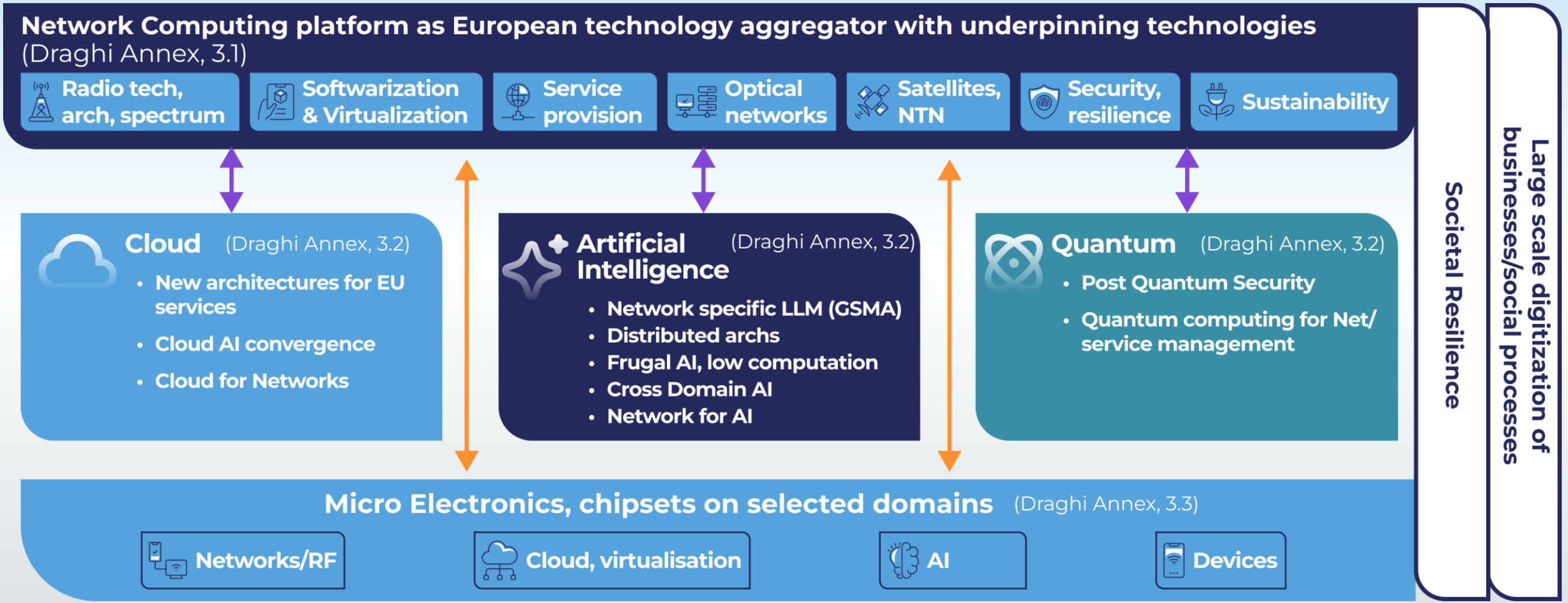


Major differences with respect to 5G

Capabilities	IMT-2030 (6G)	IMT-2020 (5G)
Peak data rate	50-100-200 Gb/s	20 Gb/s
User exp. data rate	300-500 Mb/s	100 Mb/s
Spectrum efficiency	1.5-3 x IMT-2020	
Area traffic capacity	30-50 Mb/s/m^2	10 Mb/s/m^2
Connection Density	10^6 –10^8 dev/km^2	10^6 dev./km^2
Mobility	500 – 1 000 km/h	500 km/h
Latency	0.1 – 1 ms.	1 ms.
Reliability	10^{-5}- 10^{-7}	10^{-5}

- IMT-2030 KPIs significantly more demanding than those for IMT-2020
- 6G to support selected United Nations' SDGs: sustainability, inclusion, trustworthiness,…
- Requires integration of new technology components: key innovations in radio access and core networks

Plan future instruments



Need for integrated implementation

- **Synergies from R&I to pre-deployment** from the start & at the Progamme level: not all technologies are at the same maturity level.
- Include the entire **life cycle through** a well-defined set of technologies, use cases, and timelines, akin to initiatives in other regions.
- **Include new activities:** defence, transfer of technologies to start ups.
- **Facilitate the execution of cross-cutting activities** (Chips JU, Photonics HPC, Quantum, etc.)
- **Respond to the suggestions from PKH, Draghi, and Heitor reports**

Thanks for your attention!

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