MECON Project: Multi-Access Edge Computing over NTN for Beyond 5G & 6G

Enabling Seamless Integration of Satellite and Terrestrial Networks

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Project Overview

Non-Terrestrial Networks (NTNs) are vital for achieving the full potential of 5G and 6G, providing global coverage and reliable connectivity where terrestrial networks cannot reach. The MECON project focuses on the seamless integration of satellite networks into future unified networks, enabling cost-effective, on-demand global coverage, particularly in crowded and underserved areas, while ensuring high-speed mobility, energy efficiency, and support for critical applications, including IoT and real-time services.

The global 5G NTN market is projected to grow by USD 18.35 billion from 2023 to 2028, reaching USD 22.7 billion (Technavio), positioning MECON to drive innovation in this rapidly expanding sector.

Innovative Technical Approach

MECON envisages integrating NTNs with 5G/6G systems through four core innovations:

1. Native Air-Space Integration: Merging terrestrial, aerial, and space networks to boost efficiency and prepare for Beyond 5G and 6G scenarios.

2. AI-Driven Optimization: Leveraging AI, Integrated Sensing and Communication (ISAC), Onboard MEC and 3D mobility management to cut operational costs and enhance network autonomy.

3. Ultra-Low Latency Solutions: Reducing end-to-end delays by up to 70% to enable real-time services over NTNs and terrestrial networks.

4. Broadband communications: Supporting swarms of drones operating in diverse environments, by enabling reliable, low-latency connectivity for real-time data exchange, coordination, and control.

5. Optimized beamforming management: Enhancing energy efficiency, coverage, and network capacity, to ensure effective and sustainable resource utilization.

6. Distributed Multi-tenants, Multi-Domain Orchestrator: A Distributed Multi-tenant, Multi-domain Orchestrator with autonomous operation capabilities enables comprehensive management of both NTN and TN, either from a centralized orchestrator or distributed at the edge and onboard NTN platforms. It supports multi-domain, multi-vendor, and multi-tenant environments, integrating network slicing, neutral hosting, and cloud computing capabilities to orchestrate diverse network and service components with real-time, autonomous decision-making for scalable, flexible, and resilient operations.

All MECON solutions will be fully compliant with 3GPP, O-RAN, ETSI, ITU-T, and other international standards, to ensure seamless interoperability and deployment across diverse environments.

Key Results & Innovations

MECON is driving the seamless integration of NTNs with 5G/6G systems to enable ubiquitous, cost-effective, and high-speed global connectivity. Key innovations include enhanced MEC efficiency through automation and steerable beams, self-organizing networks for automated slicing and traffic management, and AI/ML-driven optimization for smart resource management.

Real-World Applications

MECON's effectiveness will be validated through critical use cases that highlight its potential to bridge the digital divide:

- Global connectivity that is universally accessible, available everywhere, at any time, and affordable for all
- Post-disaster recovery and emergency communications
- Remote monitoring and industrial applications
- eHealth and telemedicine in underserved areas
- Precision farming and agricultural monitoring
- Public safety and maritime communications

Market Impact & Business Opportunities

MECON aims to transform the satellite communication market, projected to reach USD 71.6 billion by 2030, by overcoming limitations of siloed providers through an innovative service orchestration platform. The project targets influencing ~8% of the NTN market, with an expected market share of around 2.8%.

The MECON platform enables hybrid connectivity solutions for sectors like public safety, agriculture, shipping, and healthcare, creating new marketplace opportunities through revenue-sharing business models that benefit both satellite operators and consumers with tailored, cost-effective connectivity solutions.

International Consortium

MECON brings together leading industry and academic partners from across Europe and beyond:

- AdvTec (GB)
- Beyond Vision (PT)
- CTech (TR)
- Instituto de Telecomunicações (PT)
- IS Wireless (PL)
- Koala Tech (PT)
- London South Bank University (GB)
- PDMFC (PT)
- Pente Networks (IL)
- neXat (BE)
- Türk Telekommunikasyon (TR)

Collaboration & Synergies

MECON is actively seeking collaboration with companies and organizations working on NTN, 5G/6G, satellite communications, and related technologies to:

- Build strategic synergies and partnerships
- Explore joint exploitation of MECON innovations
- Share knowledge and best practices
- Develop market-ready solutions together
- Access cutting-edge research and development results

Contact & Connect with Us

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