6G-INTEGRATION-01-E19: Report on communication and dissemination activities

6G-INTEGRATION

Full Title: Construction of an ecosystem for research and development in non-terrestrial networks (satellite and HAPS) and B5G (3GPP rel. 17 and beyond): NTN networks for LEO satellites and for HAPS platforms.

Program: UNICO 5G I+D 2021

Start date: Jan 1, 2024   End date: Dec 31, 2024

Duration: 12 months

Document type	Deliverable
Document Id	6G-INTEGRATION-01-E9
Document title	Report on communication and dissemination activities
Document responsible	Daniel Segovia (UC3M)
Document editor	Daniel Segovia (UC3M)
Receiver	Daniel Segovia (UC3M; 6G-INTEGRATION Principal Investigator)
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Version	1.0
Planned Due date	December 31, 2024
Actual submission date	December 10, 2024

Executive Summary

The press note published just before the Mobile World Congress is presented in this report. The visibility of the press note reached most participants in the MWC.

Resumen ejecutivo

Se presenta la nota de prensa que se publícó unas semanas previas al Mobile World Congres en Barcelona. La visibilidad que tuvo esta nota de prensa alcanzó a los participantes del Mobile.

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uc3m

Glossary

3GPP   3rd Generation Partnership Project

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B5G   Beyond 5G

UC3M   Universidad Carlos III de Madrid

1 Press note

Ericsson, Grupo Oesía and UC3M demonstrate scenarios of integration of 5G-Advanced and Non-Terrestrial Networks (NTN) technologies

Ericsson, Grupo Oesía and UC3M demonstrate how a portable 5G gNodeB can leverage Non-Terrestrial Networks (NTN) as Backhaul, for delivering 5G services in remote areas where only satellite coverage is available.

Flexible switching of 5G traffic (ATSSS) for routing it either towards the 5G infrastructure (3GPP access) or via the satellite link (non-3GPP access), for providing direct internet access was also demonstrated.

Madrid, Spain - [31 January 2025]

The joint effort of Ericsson, Grupo Oesía and UC3M has validated how NTN (Non-Terrestrial Networks) can be leveraged as backhaul for 5G-Advanced networks. To this end, the transport network between the gNodeB of a portable Private Network system (remote system) and the Control Plane functions at 5TONIC Data Center (5G Public network core) was configured over a Low Earth Orbit (LEO) satellite network. So, in this scenario a light, portable 5G Private Network system that can be deployed at any remote location with no connectivity to internet at all may perfectly provide local private communications service to 5G users at that location, while also enjoying connectivity to the 5G Control Plane and to the Internet over an NTN link.

Furthermore, the seamless transition from a fiber to a satellite backhaul was successfully validated, implementing 3GPP Advanced Traffic Steering-Switching-Splitting (ATSSS) -based solution. The process maintained uninterrupted operation on the B5G network, with the Round-Trip Time (RTT) increasing from 10 milliseconds (with fiber) to 125 milliseconds (with satellite), and despite that change, the User Equipment (UE) stayed registered and sending and receiving traffic, confirming a smooth transition from the end user point of view.

This integration of portable 5G gNodeB with NTN as backhaul adopts and implements the specifications developed by 3GPP, in Release 17, regarding the integration of Non-Terrestrial Networks (NTN). In particular, 3GPP TS 23.501: 'System Architecture for the 5G System' provides guidelines on how to integrate NTN links with the 5G infrastructure. Additionally, 3GPP Rel17 recommendations for Public-Network

Integrated Non-Public Network (PNI-NPN) models have been followed in this project. Altogether full compatibility with the defined standards defined by 3GPP has been ensured, therefore demonstrating a fully interoperable solution.

This ecosystem collaboration has been facilitated by Professor Daniel Segovia of Universidad Carlos III de Madrid (UC3M) in the context of the 6G-Integration project, within the Spanish UNICO 5G R&D programme backed by EU NextGeneration funds. In this project, Ericsson has provided 5G network infrastructure, both radio access and core and Grupo Oesía contributed with innovative satellite communications devices and services, whilst UC3M was in charge of the overall project coordination.

Manuel Lorenzo, Head of Technology and Innovation at Ericsson R&D Spain, comments that "At 5TONIC lab, Ericsson has achieved a major milestone, in collaboration with Grupo Oesía and UC3M, demonstrating how a portable gNodeB can utilize Non-Terrestrial Networks (NTN) as backhaul for delivering 5G services in remote areas where only satellite coverage is available. This pioneering integration also allows for a seamless transition from fiber to satellite backhaul, for maintaining continuous operation in 5G-Advanced networks in many scenarios."

Grupo Oesía, with its hyper-specialized company in Satellite Broadband technology Inster-Grupo Oesía, has had as its objective in this project the development of an advanced satellite terminal. To do so, the company has carried out the development of an advanced satellite terminal with electronic steering antenna in Ku band that operates in a LEO constellation. This portable LEO satellite terminal with fully automatic performance was able to provide the necessary backhaul to the remote gNodeB and maintain 5G communications.

Going forward, the collaboration between these companies and institutions will tackle the use of NTN as the access network, working in integration with the 3GPP network, enabling the digital transformation of rural areas.

About 6G-Integration project
The 6G-Integration Project focuses on integrating Non-Terrestrial Networks (NTN), including satellites and high-altitude pseudo-satellites (HAPS) with 3GPP mobile networks on the road towards Beyond 5G (B5G) networks. https://unica6g.it.uc3m.es/en/6g-integration/

About Grupo Oesía
Grupo Oesía is a Spanish multinational dedicated to engineering digital and industrial dual use, which develops and implements projects in more than 40 countries. It has more than 3,600 professionals in 18 corporate headquarters spread across Europe, Latin America and Middle East.

Throughout almost 50 years of experience, it has innovated products and services that benefit billions of people around the world, with the purpose of creating a better, more efficient, safe and sustainable world.

In its commitment to hyperspecialization, it has 5 brands, each an expert in its area: Oesía Networks, (digital transformation); Tecnobit-Grupo Oesía, (cutting-edge technological products and solutions in intelligent vision, simulation and tactical and secure communications); Cipherbit-Grupo Oesía, (cybersecurity and secure communications products (cifra)); UAV Navigation-Grupo Oesía, (guidance, navigation and control systems for unmanned aerial vehicles); and Inster-Grupo Oesía, (technology for terrestrial, naval, air and space satellite communications). https://grupooesia.com/

About UC3M

UC3M is a leading University in Spain that contributes to the improvement of society through teaching of the highest quality and cutting-edge research in line with stringent international guidelines. The University aspires to excellence in all its activities, with the aim of becoming one of the top universities in Europe. https://www.uc3m.es/

About Ericsson

Ericsson is a world leader in the rapidly changing environment of communications technology – by providing hardware, software, and services to enable the full value of connectivity. https://www.ericsson.com/