GSMA Working Groups LinkedIn Live

NTN: Shaping the Interoperability with Terrestrial Networks

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GSMA Working Groups

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Five reasons you should join GSMA Membership

Discover how we can transform your business

Agenda

Today's LinkedIn Live session will cover:

Overview and activities of the GSMA NTN Community group
NTN related activities in GSMA Working Groups
NTN: Shaping the Interoperability

Q&A

Please share your questions in the chat.

GSMA

Barbara Pareglio

Senior Technical Director
GSMA

Michele Zarri

Senior 3GPP Expert
Huawei

Shabaz Ali

VP of Product and Standards
Sateliot

Barbara Pareglio

Senior Technical Director
GSMA

Non-Terrestrial Networks Community

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GSMA Non-Terrestrial Networks Community

Launched in 2024, the GSMA NTN Community is a global initiative designed to accelerate the integration of terrestrial and non-terrestrial networks.

Scope:

- It brings together mobile network operators, satellite providers, vendors, and technology leaders to collaborate on the future of connectivity.
- Promote the integration of Terrestrial Network (TN) & Non-Terrestrial Network (NTN) standard technologies to help accelerate TN & NTN adoption, enable interworking and ensure interoperability.
- Publish white papers/reports/case studies.

Not a GSMA member? Join us today!

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Non-Terrestrial Networks – opportunities and challenges

GSMA NTN White Paper launched in June 2025

- NTN overview
- TN/NTN interworking
- Technical and spectrum-challenges
- Standardisation landscape & ecosystem outlook
- Direct-to-device satellite connectivity
- NTN use cases & integrated TN/NTN deployments
- NTN Terminal design requirements & challenges

WHITE PAPER

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NTN Community – collaborating with others

Importance of the NTN Community

With over 60 organisations participating, the community is providing a thought leadership on all topics related to NTN.

The community maintain oversight of all developments for NTN and contribute with **requirements** and guidance to the groups when needed.

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Potential work in 2026

Start looking at security impacts, particularly learning from current deployments.

Continue support of interworking by looking at real deployment scenarios, for NG and WAS

Continue support the work on the terminal, both for test support and the network selection as part of TSG

Strengthen cooperation with other association/organisations and potential exploration of area of work

Publish case studies to highlight some of the capabilities and interworking

Advocate the work through events, workshops, webinars, etc

Upcoming activities

Satellites & NTN Workshop @NA RIG

Thursday, February 17, 2026 | 1:30 PM – 5:00 PM ET

Do not miss the Satellites & Non-Terrestrial Networks (NTN) Workshop, bringing together industry experts and ecosystem leaders to explore the current regional landscape.

Next NTN Community meeting

Next meeting 28th January 13:00 – 15:00 UK

Meetings are regularly held every month.
The Community is open to all GSMA members.

MWC 26

2 - 5 March

Several planned sessions related to NTN. Principally:

Satellite and NTN Summit, 4th of March 10:00 - 13:00 CET, GSMA Summits Stage, Hall 6. For all tickets holders

Explore the New Frontier in Hall 6

Join GSMA Non-Terrestrial Networks Community

Feel free to reach out to:

ntncommunity@gsma.com

Public page for the NTN Community:

https://www.gsma.com/futurenetworks/non-terrestrial-networks-community/

GSMA Membership:

https://www.gsma.com/get-involved/gsma-membership/become-a-gsma-member/

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Michele Zarri

Senior 3GPP Expert
Huawei

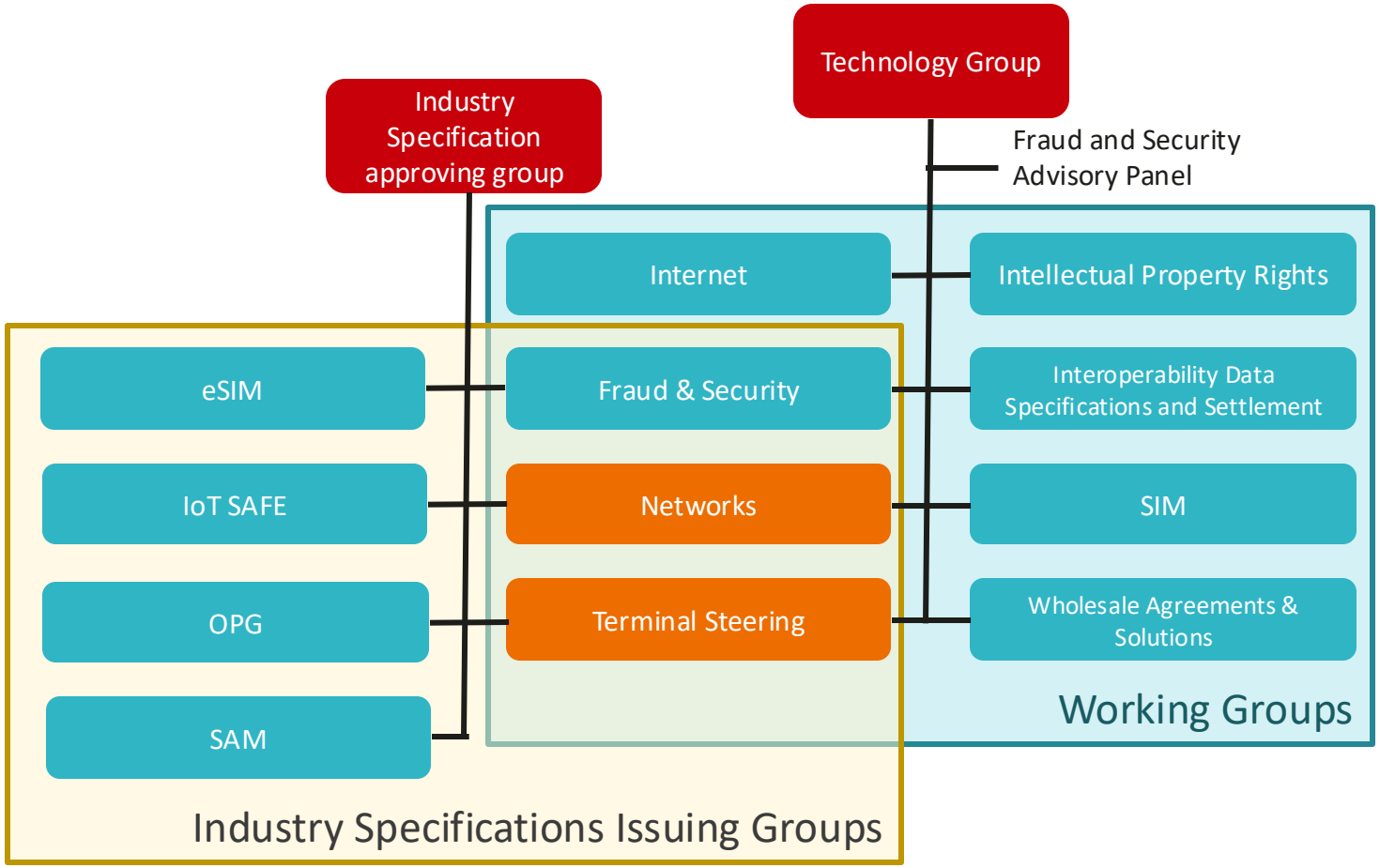
NTN related activities in GSMA Working Groups

NTN Related activities in GSMA NG and TSG

Author : Michele Zarri
Date : 2026/01/19

GSMA Working Groups -- general information

What are they and what do they do?



GSMA Working Groups

- report to the Technology Group which reports directly to the GSMA Board
- Some working groups also report to the Industry Specifications Approving Group (ISAG)
- Each working group focus on different areas of competence
- Deliver solutions and specifications (Permanent Reference Documents) for the mobile industry where interworking and interoperability is required, e.g. VoLTE, Roaming, eSIM…
- Most of the PRDs are publicly available and free to download

GSMA Members provide subject matter experts to the Working Groups

GSMA provides support via a Director and a Coordinator

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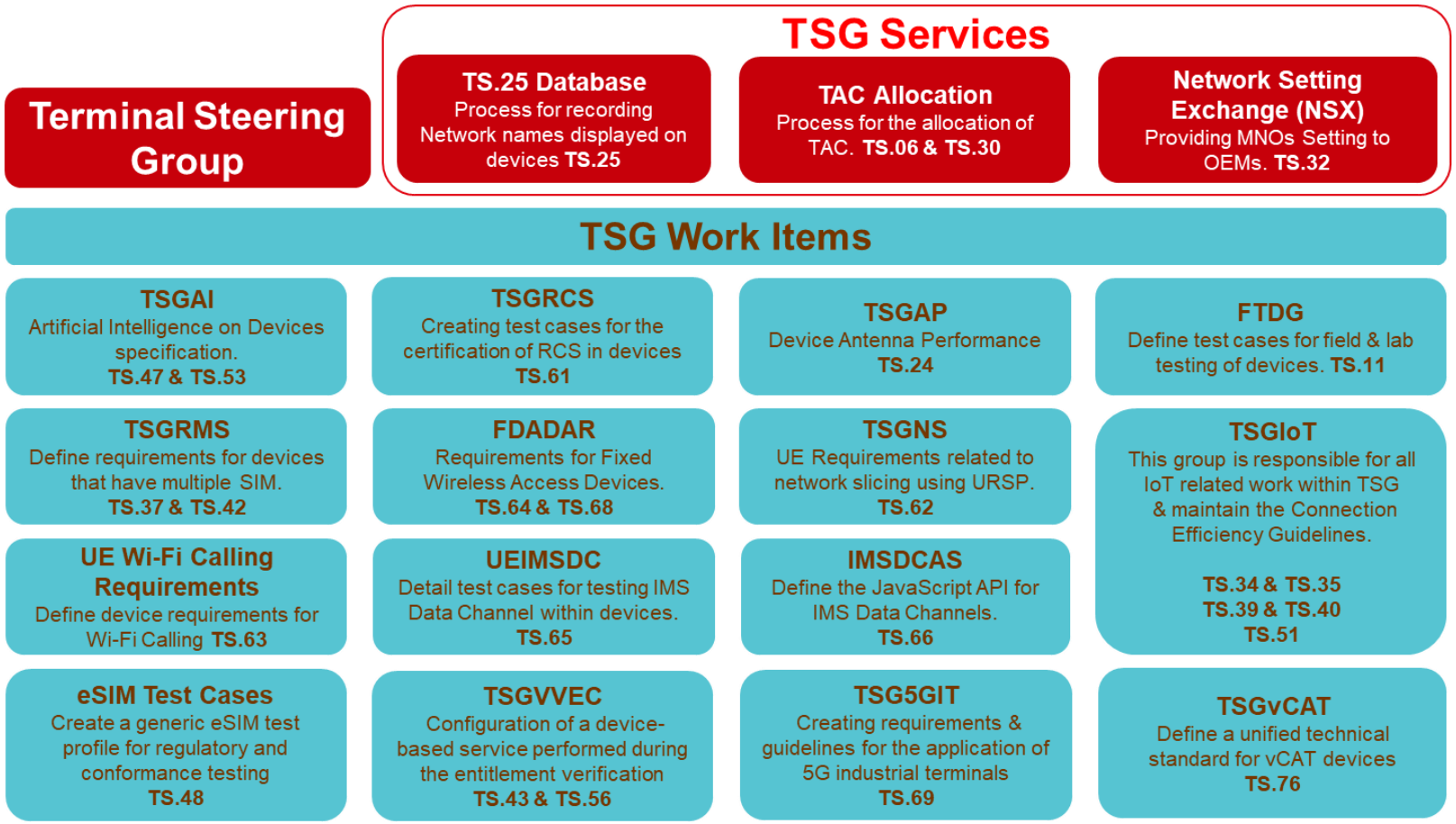
GSMA Terminals Steering Group

Overview of the group



Terminals Steering Groups

Manage terminal activities within GSMA to avoid fragmentation and enhance services, usability, security and consistency

- Meets 4 times a year and holds several conference calls between meetings.
- Detailed technical work is mainly carried out in sub groups that focus on an individual work item or study item
- The TSG plenary role includes:
  - Approval of new study and work items
  - Approval of the change requests to PRD
  - Administration
- An important sub-group of TSG is the Field Trial Group which defines test cases for field and lab testing of devices

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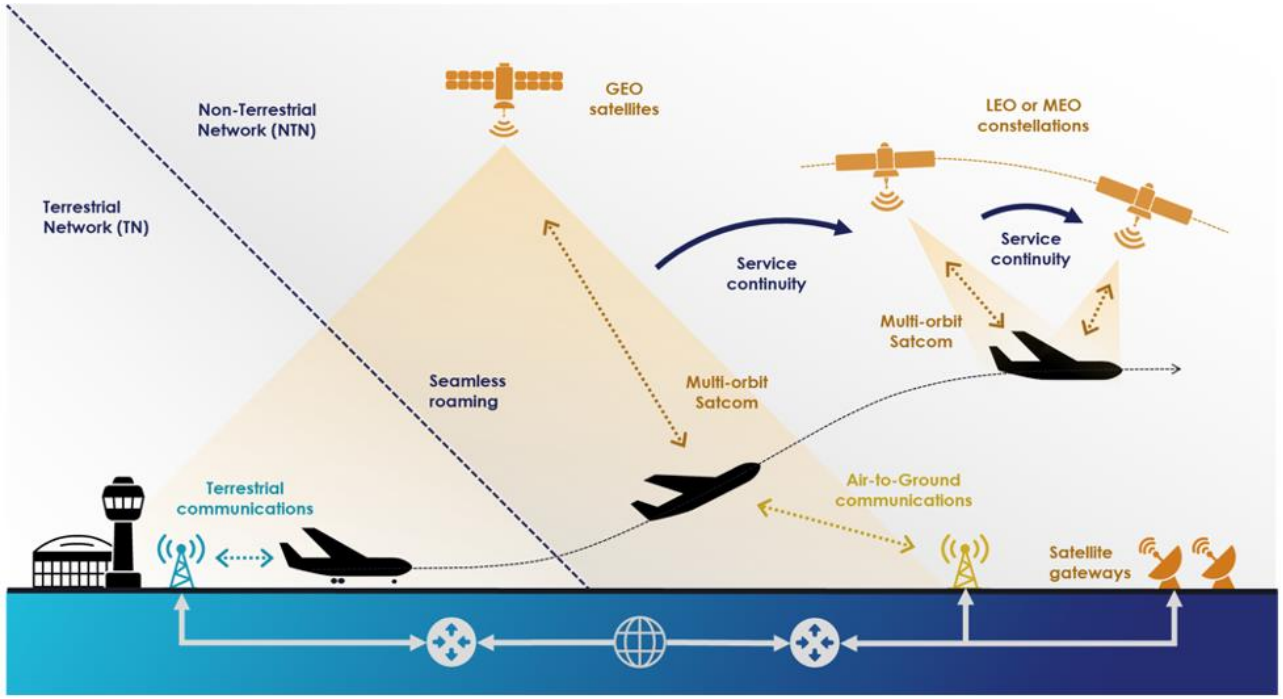
GSMA TSG NTN activities

Network and cell selection optimizations for NTN (TSNTN working group)

- This activity aims to investigate possible enhancements of the standards regulating PLMN selection and cell reselection when the source or target includes a satellite component. Multiple use cases are considered including multi-orbit use cases and interworking with terrestrial networks.



The image to the left, taken from the draft PRD provides a visual summary of all the scenarios covered by this activity.

- Selection of a satellite network when the plane leaves the terrestrial network upon take-off
- Use of both GEO and LEO or MEO satellites whilst in flight 4multi-orbit.
- Continuity of service when moving between different access types (NOTE)

NOTE: service continuity when moving between different networks (inter-PLMN handover) is currently not widely supported in Terrestrial networks)

GSMA TSG relevant activities for NTN

Ongoing TSG activities that are relevant for devices accessing the network via satellite

Field Test Group (FTDG).

- Will document in the future test cases that a device using satellite access is expected to pass. FTDG output (TS.11) is used by certification authorities such as the Global Certification Forum (GCF) and PTCRB

Antenna Performance Group (TSGAP).

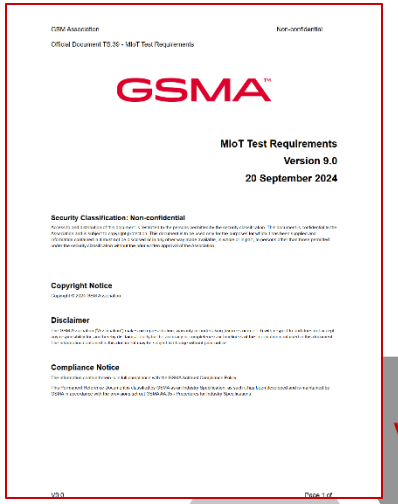
- This group manages PRD TS.24 which defines operator acceptance values and testing criteria for antennas onboard devices. Work may be extended to include specific requirements for the performance of antennas in the device used to connect to satellites.

Service Entitlement.

- Currently the entitlement server defines a standardized framework for mobile operators to configure and verify services on user devices. Work is ongoing to also take into account the use of satellite-based services.

Interoperability test cases for IoT-NTN.

- TSG conducted a comprehensive activity to define test requirements and test cases for IoT-NTN as documented in TS.39 ”MIoT Test Requirements” and TS.40 MIoT Field and Lab Test Cases”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MIoT Test Requirements
Version 9.0
20 September 2024

Security Classification: Non-confidential

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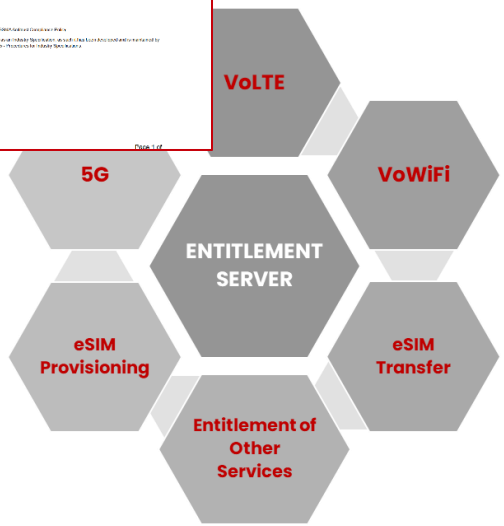

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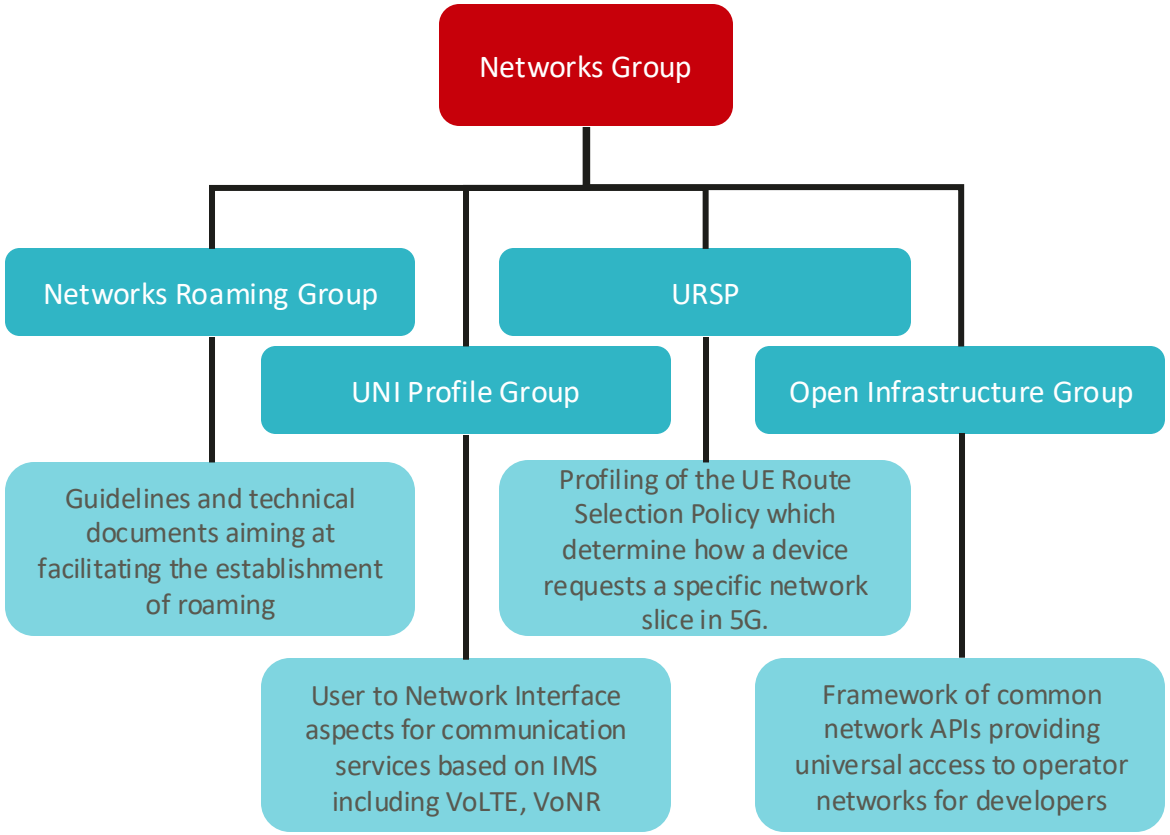
GSMA NG

Overview of the group



Networks Groups

The Networks Group (NG) specifies technical, operational, and performance requirements to support international roaming and interworking, taking into account technology evolutions.

NG has 4 hybrid meetings per year and manages 4 working groups:

- Detailed technical work is mainly carried out in sub groups

The NG plenary role includes:

- Work on areas not covered by sub-groups
- Approval of output from sub-groups
- Approval of new study and work items
- Administration

GSMA NG NTN activities: NTN roaming

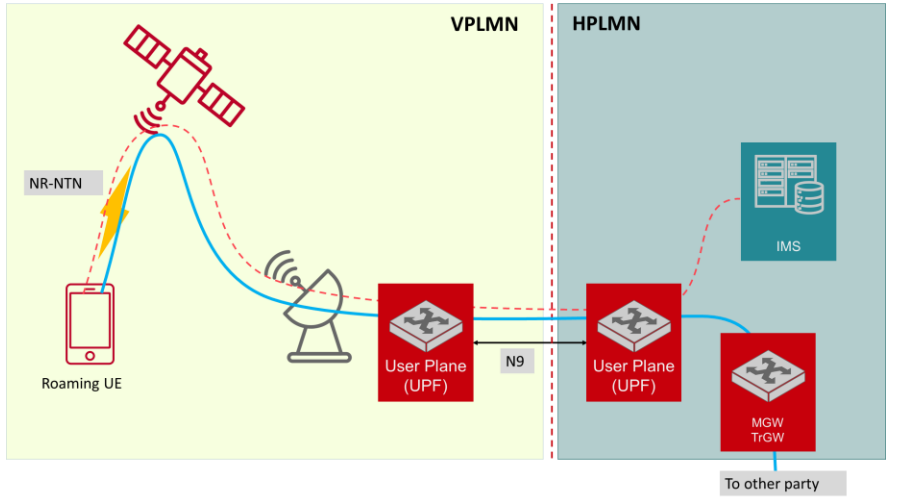
A New work item is expected to be launched to address the potential issues of providing roaming services via NTN

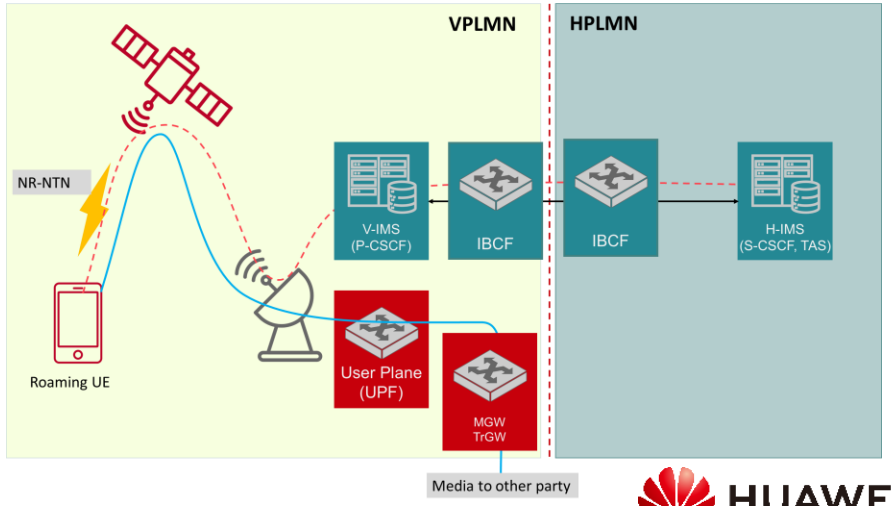
Scope

- The study will cover both NB-IoT NTN roaming and NR NTN roaming;
- both NTN-TN and NTN-NTN.
- impacts on roaming architecture of the satellite constraints of the VPLMN and the service and SLA intents of the HPLMN

Goals

- Reduce future fragmentation: promote consistent deployment practices.
- Avoid vendor-specific interpretations: To provide roaming oriented deployment guidelines, clearly separating functional requirements, operational constraints, and implementation choices. Prevent proprietary extensions and bilateral custom integrations.
- Ensure that 3GPP solutions are deployable at scale for HPLMN/VPLMN supported roaming scenarios: To validate the existing 3GPP mechanisms that operate across multiple roaming partners accounting for the satellite constraints and HPLMN service intents. And highlight gaps where protocol and feature level enhancements may be required.





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GSMA NG relevant activities for NTN

Ongoing activities that are relevant for non-terrestrial network operators

Voice profiles

- GSMA NG maintains profiles for voice over IMS which are meant to make the interoperability of devices and networks easier to achieve. As satellite operators are expected to also offer voice and messaging via IMS they may require to update such profiles.

Support for emergency calls and messaging

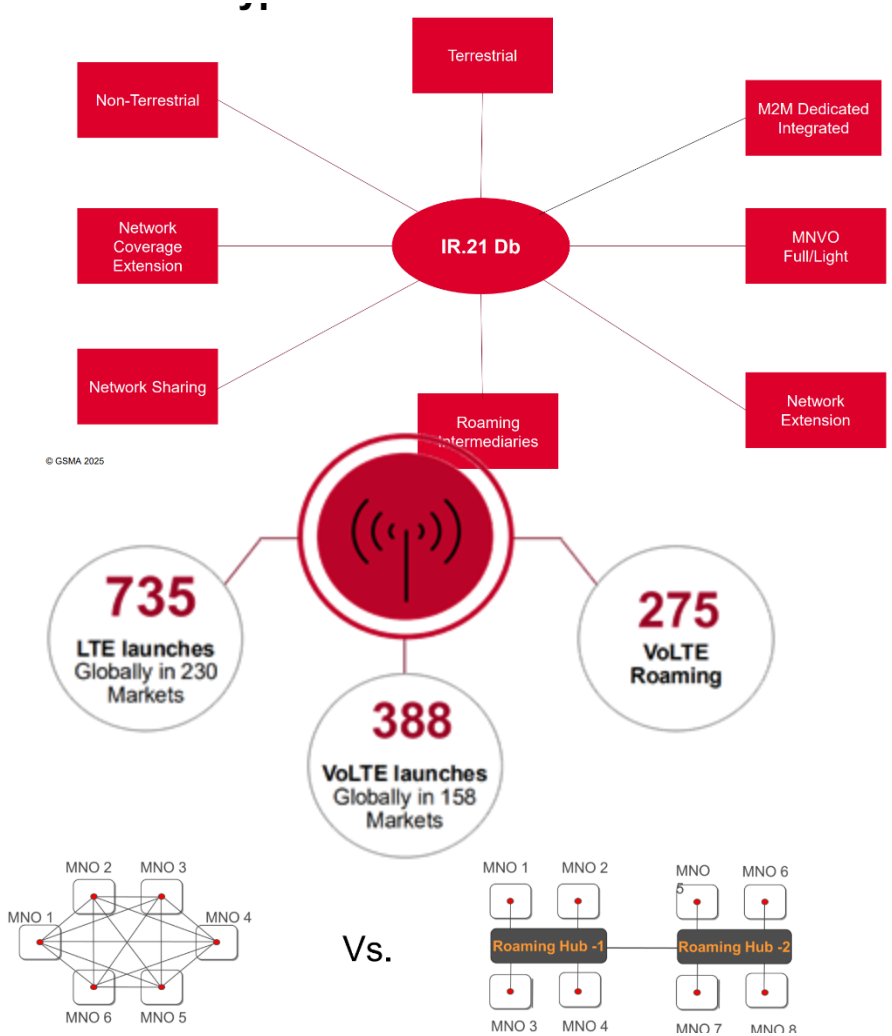
- Most of terrestrial operators are subject to the obligation of providing emergency calls and possibly other services as part of their spectrum license conditions. As this mandate may impact also satellite operators they can leverage the wealth of expertise of NG in this area.

Mission critical services

- GSMA has been working on the support and testing of services to be offered to mission critical authorities (MCPTT, voice, messaging, etc..) in roaming scenarios. It is beneficial to also enhance these services so that they can be offered via satellite

IR.21

- Essentially a database that facilitates the establishment and maintenance of the roaming agreements. As satellite operators start participating to roaming they will need to also contribute their data and potentially add new specific fields. Work to support NTN IoT roaming already under way.



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Thank you.

把数字世界带入每个人、每个家庭、
每个组织，构建万物互联的智能世界。

Bring digital to every person, home, and organization for a fully connected, intelligent world.

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Shahbaz Ali

VP of Products and Standards
Sateliot

NTN: Shaping the Interoperability

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NTN: Shaping Interoperability with Terrestrial Networks

Our Mission

Unifying the mobile ecosystem to bridge the digital divide by integrating satellites, HAPS, and UAS with terrestrial networks.

Strategic Objective

Act as the primary engine to generate technical and commercial requirements for other GSMA Working Groups.

A Collaborative Effort

Leveraging time and expertise from MNOs, satellite operators, and terminal manufacturers to ensure global interoperability.

Reference Document: GSMA White Paper (June 2025): "Non-terrestrial networks - opportunities and challenges"

NTN: Shaping Interoperability with Terrestrial Networks

Strategic Objective

Acting as the primary engine to generate technical and commercial requirements for GSMA Working Groups and provide actionable guidelines

Technical Integration for Seamless Global Mobility

GSMA Network Group Activities

Network Roaming Group (NRG)

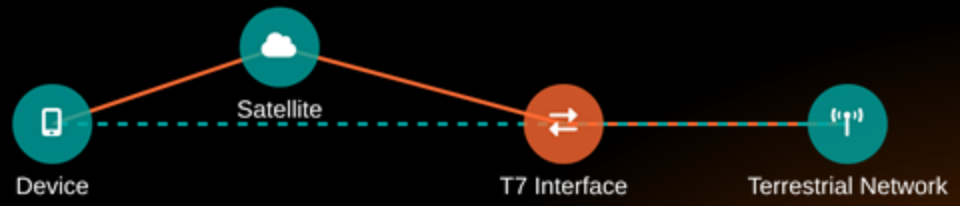
Developing a dedicated Work Item (WI) for NTN roaming architectures, presentation scheduled for January 2026.

IR.21 Enhancements

Proposed updates for the next release to incorporate NTN-specific operator roaming configurations and parameters.

Meeting Date: January 2026

Standardized Interfaces



Why T7 Interface?

- Supports User Equipment (UE) reachability events
- Enables network-aligned buffering for intermittent connectivity
- Handles long propagation delays efficiently
- More effective than traditional custom tunneling methods

Technical integration is the foundation for seamless global mobility

Commercializing the Satellite-Terrestrial Partnership

The GSMA Wholesale Agreements and Solutions (WAS) group is developing standardized commercial frameworks to enable widespread adoption of NTN.

AA.106 Agreement

A standardized contract template that simplifies complex bilateral deals between mobile network operators and satellite operators.

- Streamlines commercial and legal aspects

BA.46 Principles

Defines fundamental rules governing commercial interaction between satellite and terrestrial networks.

- Coverage Authorization
- Signal Leakage Prevention
- Home Network Identification

SLA Templates

Uniform Service Level Agreement Templates incorporating satellite-based performance metrics.

- Provides measurable framework for service delivery

Wholesale Coordination

Collaborating with WAGREE to update existing permanent roaming documents for satellite communication.

- Facilitates seamless commercial operations

Standardized agreements are the foundation for widespread NTN adoption

Evolving Priorities for a Global Satellite IoT Ecosystem

Key drivers necessitating new NTN IoT billing approaches

Massive Connectivity Scale

Legacy systems not built for millions of IoT connections over NTN

Intermittent Link Realities

Lean constellations disrupt traditional real-time charging

Protocol Diversity

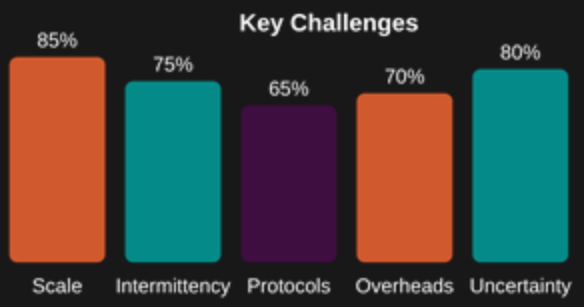
Different IoT protocols require tailored billing approaches

Operational Overheads

High latency and data backhaul costs drive edge-based solutions

Usage Uncertainty

AI-driven forecasting and adaptive pricing for unpredictable usage

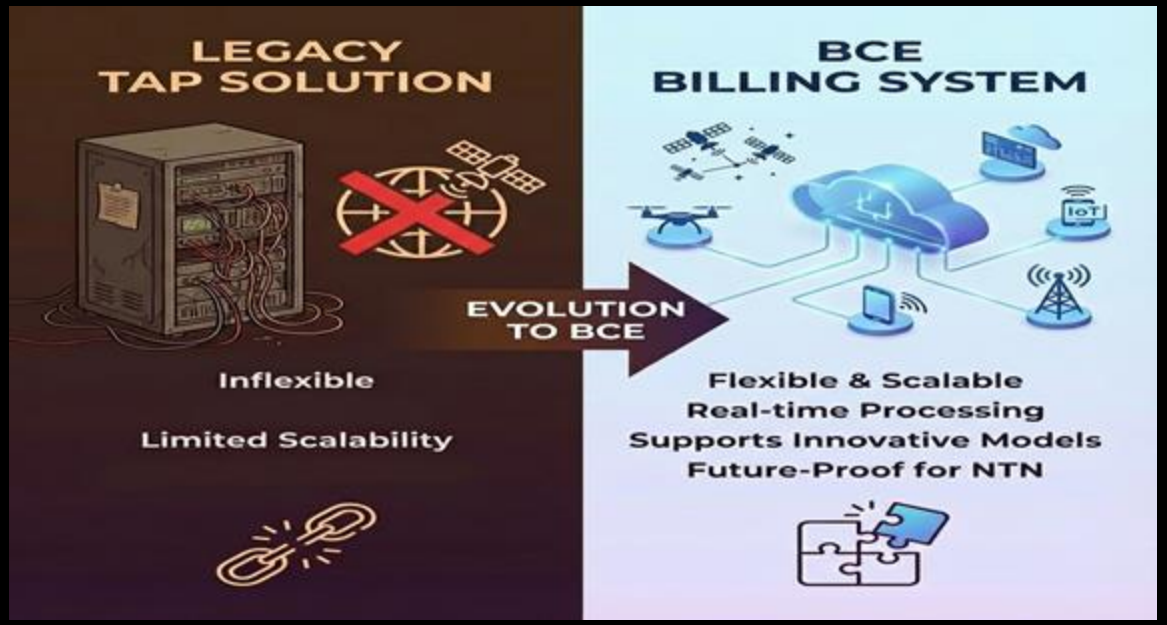


Traditional billing approaches are inadequate for the unique challenges of satellite IoT

Modernizing Interconnection for NTN Commercial Success

Billing and Charging Evolution (BCE)

Replaces rigid, legacy TAP systems with a flexible framework tailored for 5G and IoT monetization, bridging satellite and terrestrial commercial frameworks.



BCE enables secure and cost-effective settlements between MNOs and SNOs

Key BCE Features

Adaptive Pricing

Flexible pricing models ensure enterprise affordability while covering satellite link costs.

AI/ML Integration

Enhances predictive billing and fraud prevention by analyzing data patterns across constellations.

Edge Optimization

Improves billing accuracy by processing data closer to the source to mitigate high latency.

Security & Integrity

Ensures data integrity in long-distance connections and maintains compliance with global standards.

Enables a thriving global IoT ecosystem regardless of device location

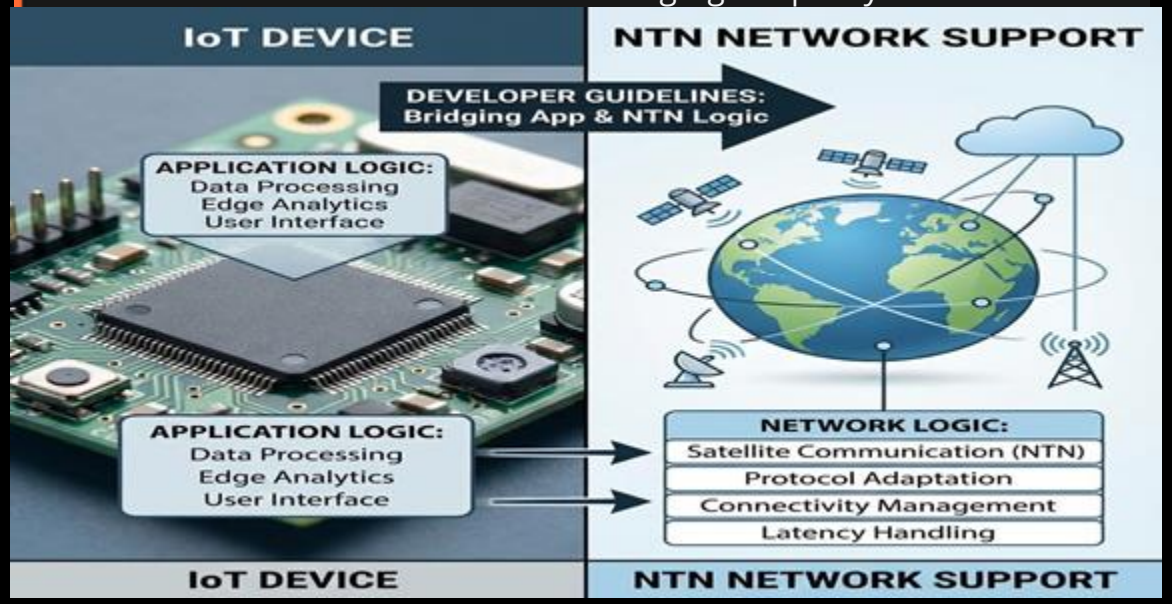
GSMA 5G IoT Strategy Group: Practical Industry Guidance

Standardization Progress

Tracking NTN features within 3GPP releases, from initial integration in Rel-17 to advanced concepts in Rel-19/20.

Technical Challenges

- High propagation delays (**up to 100ms for GEO**)
- Significant Doppler shifts
- Variable channel conditions affecting signal quality



Software Resilience

- Implement **"NTN-aware" logic** within device software
- Use patient retry algorithms for intermittent connectivity
- Implement connection watchdogs to monitor link status

Network Protection & Energy Efficiency

Network Protection

Implement randomized reconnection timers to prevent "thundering herd" overloads.

Energy Efficiency

Align device wake-up cycles with predictable satellite passes in LEO deployments.

Harmonizing Behavioral Expectations for Global Scale

Streamlined Certification Process

Key Benefits

- One device that works predictably across any satellite network
- Drastically reduced integration costs
- Accelerated time-to-market for NTN-enabled devices
- Ensures consistent performance across terrestrial and satellite

Behavioral Profile Features

Recommendations / Guidelines

Creating GSMA recommendations/guidelines that help OEM and NTN device manufacturers for speedy certification NTN Networks

Standardized Link Indicators

Harmonize module communication link conditions and application

Efficiency for OEMs

Providing a single, GSMA-endorsed reference for "Ready for Deployment" devices.

> *"We want to standardize how devices handle retries and access selection in mixed environments."*

¡Gracias!

Shahbaz Ali
VP Products & Standards Sateliot
shahbaz.ali@sateliot.com

www.sateliot.space

Q&A

Survey

Scan to participate

Please take a moment to complete this short survey

- It will take just 2 mins
- GSMA Confidential (Disclaimer Note: All responses will be anonymous and will be treated internally only for GSMA purposes)
- We will use it to inform future learnings and activities
- Thank you!

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Thank you

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