Non-Terrestrial Roaming Principles

6.3

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1 Introduction

1.1 Overview

This document defines principles for Non-terrestrial roaming. The Non Terrestrial services are used by Operators to provide coverage in International Zones and National Zones where they are authorised to do so. This PRD is intended to establish the methodology to facilitate roaming when Non-Terrestrial networks are used.

1.2 Scope

In-Scope

- Aeronautical Roaming
- Maritime Roaming
- Network Extensions

Out-of-Scope

- Terrestrial Roaming
- Satellite Roaming

2 Definition of Terms

Term	Description
AA.12	GSMA Permanent Reference Document - International Roaming Agreement
AA.13	GSMA Permanent Reference Document - International Roaming Agreement – Common Annexes
AA.14	GSMA Permanent Reference Document - International Roaming Agreement – Individual Annexes
BA.01	GSMA Permanent Reference Document - Disputed calls and amounts and requests for credit
BA.20	GSMA Permanent Reference Document - Fraud Prevention Procedures
BA.50	GSMA Permanent Reference Document - Technology Neutral Agreements Handbook
C.11	Annex to AA.13
Client Operator	Operator that utilises the NTNE functionality provided by the Host Operator.
Host Operator	Operator that uses the NTNE principles and extends its existing roaming relationships to a Non terrestrial network.
HPMN	Home Public Mobile Network.
International Zones	Coverage space which is not terrestrial and is considered outside of National license/ authorisation limitations such as International waters and airspace.
IREG	GSMA International Roaming Experts Group.
IR.21	The official document for PMN technical network information.
ITU	International Telecommunication Union.
MCC	Mobile Country Code.
MNC	Mobile Network Code.

MSC	Mobile Switching Centre.
MSRN	Mobile Subscriber Roaming Number.
National Zones	Coverage space that is national and is bound to the license/ authorisation of that country/region.
NTO	Non-Terrestrial Operators. Non-terrestrial operators are wholly independent from any Terrestrial network and operate in International Zones and National Zones where they are authorised to do so. These operators are known as Non-Terrestrial Operators 'NTO'.
NTNE	Non-Terrestrial Network Extensions. A Non-Terrestrial Network Extension is where a Host Operator (where the Host Operator may be Terrestrial or Non-Terrestrial) extends its network into Non-terrestrial areas e.g. in International Zones and National Zones where they are authorised to do so. The extension is known as the Client Operator and considered a Non-Terrestrial Network Extension or NTNE.
NRTRDE	Near Real Time Roaming Data Exchange. NRTRDE is a GSMA initiative, being adopted by Operators, that reduces the risk of roaming fraud.
PRD	GSMA Permanent Reference Document.
Terrestrial Roaming	Roaming to a Territory as identified by the ITU. E.g. Canada, Italy or United Kingdom.
Serving BID	The Serving BID (Billing Identifier) is a code associated with a geographical area such as a cell site or group of cell sites.
Serving Network Field	A unique identifier used to determine the network where the call event was originally created.
Serving Location Description	A text description giving the geographical location of the terminal equipment.
SGSN	Serving GPRS Support Node.
SS7	Signalling System No.7.
TADIG	Transferred Account Data Interchange Group.
VLR	Visitor Location Register.
VPMN	Visited Public Mobile Network.

2.1   Document Cross-References

Ref	Document Number	Title
1	GSMA PRD AA.12	International Roaming Agreement
2	GSMA PRD AA.13	International Roaming Agreement – Common Annexes
3	GSMA PRD AA.14	International Roaming Agreement – Individual Annexes
4	GSMA PRD BA.21	Network Extensions Principles
5	GSMA PRD BA.22	Network Extensions Guide

3   Provision

Non-Terrestrial Roaming is provided by GSMA members via two solutions:

3.1   Non-Terrestrial Operators (NTO).

Non-terrestrial operators are wholly independent from any Terrestrial network and operate in International Zones and National Zones where they are authorised to do so. These operators are known as Non-Terrestrial Operators 'NTO'.

The service is provided in accordance with the GSM Roaming Agreements Annexes.

For avoidance of doubt, the service provision offered by a NTO is equivalent to the service provision of a standard Roaming Agreement (using AA.12 and AA.13).

In the case where there is a Maritime Operator and an Aircraft Operator operated by the same company these shall be considered separate NTO.

In some cases an NTO may consist of more than one Network with distinct MCCMNC and TADIG code for each network within that NTO.

3.2 Non-Terrestrial Network Extensions (NTNE)

A Non-Terrestrial Network Extension is where a Host Operator (where that Host Operator may be Terrestrial or Non-Terrestrial) extends its network into International Zones e.g. International Waters or International Airspace. The extension is known as the Client Operator and considered a Non-Terrestrial Network Extension or 'NTNE'.

In the case where there is a Cruise Ship Operator and an Aircraft Operator operated by the same company these shall be considered separate NTNE.

In some cases an NTNE may consist of more than one Network with distinct MCCMNC and TADIG code for each network within that NTNE.

4 GSMA and ITU Principles

4.1 Membership of the GSMA

Individual GSMA Membership is required for each NTO and/or NTNE.

Each NTO and/or NTNE will be set up on the Infocentre as Members with Organisation type listed as either Maritime Operator or Aircraft Operator.

Membership Fees for membership will be managed by the GSMA Member Services Department.

In the case where an NTO/NTNE needs a separate GSMA membership for each of its two or more networks, then this is to be agreed with GSMA.

4.2 TADIG identification of NTO and NTNE

In the case of the NTO and NTNE, TD.13 advises that the use of TADIG codes for Non Terrestrial for all new entrants should be as follows:

- Aircraft operators: AAA
- Maritime operators: AAM

4.3 ITU identification of NTO and NTNE

In the case of the NTO and NTNE, the ITU advises that the use of MCC and MNC for Non Terrestrial for all new entrants will be as follows:

- Aircraft operators: 901_XX0
- Maritime operators: 901_XX0

5 Transparency Principles

This section provides Transparency principles which need to be adopted by the NTO and NTNE to ensure successful integration of Non-terrestrial Roaming agreements.

5.1   Coastal Waters

In the case of Maritime Operators, it should be transparent that the Coastal waters are controlled by national coverage regulations. A NTNE operator with coastline may have a license/ authorisation for its own national coverage, while both NTNE and NTO may acquire from any respective national regulatory a license/authorization for that national zone.

5.2   Airspace Control

In the case of Aircraft Operators, it should be transparent that the Airspace is controlled by national coverage regulations. A NTNE Aircraft operator may have a license/ authorisation for its own national coverage, while both NTNE and NTO may acquire from any respective national regulatory a license/authorization for that national zone.

5.3   Coverage

A Non-terrestrial operator supplies coverage in International Zones and National Zones where they are authorised to do so. The appropriate approvals are required to comply with coverage regulations.

5.4   Turning off Coverage inside National Zones

Unless the NTO or the NTNE has a license/ authorisation for supplying coverage in National zones, the Non Terrestrial coverage should be turned off according to the guidelines indicated in 5.1 Coastal Waters for Non-terrestrial roaming at sea and section 5.2 Airspace Control for Non-terrestrial roaming in the air. There is therefore no handover between Terrestrial and Non-terrestrial services.

Every NTO and NTNE should ensure they are compliant with local regulation.

5.5   Leakage

In respect of the above section 5.1 and 5.2 accordingly, a NTO or NTNE must at all times avoid leakage towards terrestrial subscribers.

5.6   Device Demarcation

The roaming customer must be able to see their device switch over from Terrestrial to Non-terrestrial Roaming operation when they move between coverage areas.

5.7   Broadcast MCC MNC

The NTO and NTNE must broadcast their non-terrestrial MCC MNC as defined within their IR.21 in order for the HPMN and the roaming subscriber to identify the Non-Terrestrial VPMN by the MCC MNC displayed on the device and within the SS7 message.

The Broadcast MCC MNC must correspond with the TADIG Code as defined within their AA.14 for wholesale billing of roaming usage on the Non-Terrestrial network.

5.8   Identification of the HPMN Subscriber Location

The Host Operator offering Non Terrestrial Roaming via a NTNE, must guarantee the following information to the HPMN, in order to allow the HPMN to correctly identify the location of their subscribers:

- E.164 addresses or ranges of MSC/VLR's
- E.164 addresses or ranges of SGSN's
- IP addresses or ranges of SGSN's
- MSRN range

The use of such information enables the HPMN the correct handling of charging, tax application, lawful intercept, content download management, anti-fraud processes, real time network monitoring and management (e.g., "Welcome SMS" and "Steering of Roaming") and customer care.

6   Setting Up Non-Terrestrial Roaming

6.1   Locating Non Terrestrial Roaming Partners on the Infocentre

Each NTO and NTNE must have a unique infocentre page provided by the Infocentre.

Maritime Operators and Aircraft Operators can be located in the Infocentre under Organisation Type within the Organisation Search page.

6.2   Conditions of Launch for the NTO

An NTO must agree the Launch of the Non Terrestrial roaming Agreement by means of the International Roaming Agreement (AA.12 and AA.13) and the Launch Letter for the commercial launch of the Non Terrestrial Service.

6.3   Conditions of Launch for the NTNE

Launch of Non-terrestrial Roaming must be agreed in a documented way. When Non-terrestrial roaming is introduced by a terrestrial operator as extended coverage of an International Roaming Agreement, an Addendum to the Common Annex AA.13 should be signed e.g. C.11. A Launch Letter may also be signed between the Parties for the Commercial Launch of the Non Terrestrial Service.

6.4   Use of the AA.14

The NTO must adopt a unique and separate AA.14's for each Non-terrestrial Network and the AA.14 must be stored under the unique Infocentre page of the NTO.

For NTNE the Host Operator must have separate AA.14's for the Host Operator and the Client Operator. The AA.14 of the Client Operator must be stored under the unique Infocentre page of the Client Operator. This includes documentation shared between Host, Client and HPMN as well as documentation stored under the unique Infocentre page of the Client Operator.

NTNE Client Operators network information should be included in the Host Operator's IR.21.

6.5   Coverage Details

By nature of its borderless character, the NTO and NTNE should provide coverage details such as on which routes or transportation Non-terrestrial Service is available.

Changes to the agreed coverage areas must be communicated in advance.

6.6   Testing

It is recommended that Testing for the NTO should follow the standard procedure.

In the case of the NTNE the level of both IREG and TADIG testing is at the discretion of the HPMN. When the HPMN is considering the scope of testing required, due consideration should be made of common, previously tested, network and billing functions.

6.7   Billing for Non-Terrestrial Roaming

6.7.1   Use of TADIG Codes for Non-Terrestrial Roaming

A unique and separate TADIG code must (unless otherwise agreed in writing by the Host Operator and HPMN) be implemented by NTO and NTNE and follow the principles set out in section 3.1.3 of this PRD.

In the case of the NTNE, the Host Operator must provide a unique and separate TADIG code for each individual NTNE.

6.7.2   Use of TAP

Where possible the Non-terrestrial Operator must ensure that the HPMN is made aware of the location of the customer by passing information via the Serving BID and/or Serving Location Description fields in the applicable TAP records. The NTO or NTNE Host Operator must provide the HPMN the TADIG Code/s of its Non-terrestrial network (and Serving BID and/or Serving Location Description whenever used) in its AA.14.

6.7.3   Additional Rules for use of TAP for the NTNE Host Operator

In the case of the NTNE, the Host Operator must create a separate TAP file for each NTNE.

In some instances operators may choose an alternative solution. Provided both operators agree in writing the Host Operator may send the HPMN an aggregated TAP file including records from the Host Operator and the Client Operator provided that the Host Operator agrees to populate either the Serving Network field with the (unique and separate) TADIG code (of the Network Extension) or the Serving BID and Serving Location Description fields (for the Network Extension) in the applicable TAP records. In this case the Host Operator must provide any of these options of using either Serving Network with the combination of Serving BID and Serving Location Description, as requested by the HPMN.

The Host Operator must provide the HPMN the TADIG Codes of its Inbound Roaming Solution (and Serving BID and Serving Location Description whenever used) in its AA.14.

6.7.4   Invoice Production

Invoice production for the NTO must follow the standard procedure.

In the case on the NTNE, the Host Operator is responsible for providing the HPMN with invoices based on the TAP files sent by the Host Operator when an NTNE is used. All wholesale usage sent via TAP from a NTNE which was not bilaterally agreed in accordance with the rules stated in this PRD may be rejected via the RAP process or disputed by the HPMN according to the rules specified in BA.01.

6.8   Fraud Notification

The NTO is, as bilaterally agreed, responsible for providing all fraud notifications to the HPMN as described in BA.20 Fraud Prevention Procedures.

The NTNE Host Operator is responsible for providing NRTRDE file flows from its own network in addition to providing NRTRDE file flows from each Client Operator to the HPMN unless bilaterally agreed otherwise.

6.9   Maintenance

If new Services are introduced after the initial launch of Non terrestrial Roaming these must be agreed between the parties and the existing agreement rules must apply. Consideration should be given to the suitability of the existing International Roaming Agreement (e.g. if GPRS or 3G roaming services are launched). For further details see PRD BA.50 Technology Neutral Agreements Handbook.

Changes to the agreed coverage areas must be communicated in advance.

6.10   **Suspension on Non-Compliance**

The VPMN must suspend service on demand by the HPMN, in case the VPMN is not fully compliant to the above conditions. Such a failure is considered to be a "technical reason" for suspending Roaming Services as described in PRD AA.12 Article 14.

Document Management

Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	March 2005	New PRD (BARG Doc 65/038 Rev1).	BARG #65 EMC #nn	Jason Bryan O2 UK
2.0	7th November 2005	Ratification by GSMA General Assembly		Jason Bryan O2 UK
3.0	March 2006	Major CR 003 (BARG Doc 67/053).	BARG #67 EMC #nn	Jason Bryan Cibernet
4.0	September 2006	Major CR 004 (BARG Doc 68/029).	BARG #68 EMC #nn	Jason Bryan MACH
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Other Information

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Your comments or suggestions & questions are always welcome.

This PRD is subject to the Operator Compliancy Grading Solution (OCGS) as defined in BA.49 from the launch of OCGS.

The criterion to be used for compliancy to this PRD is as follows:

- The Operator follows BA.46 when implementing and operating their non-terrestrial network