



## Use of NRTRDE for the Single IMSI Fraud Interface

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# 1 Introduction

## 1.1 Overview

This document explains how to use NRTRDE for the optional Single IMSI Fraud Interface (SI-IF8) between the DSP and ARP.

## 1.2 Scope

This document needs to be read in conjunction with TD.35 [3].

Voice over LTE and SMS over IP is out of scope for the SI-IF8 fraud interface and for further study (will not be received on the VPMN/HPMN interface).

**Note:** TD.35 [3] has been defined for the VPMN/HPMN fraud prevention interface. The use of the document also for the DSP/ARP fraud prevention interface therefore needs to consider that it has been written to define the rules on how the VPMN must populate NRTRDE. When for example TD.35 [3] specifies “available from the network”, this shall be interpreted as “available to the DSP at the time of creation of the ARP fraud prevention file”.

## 1.3 Definitions

Term	Description
Calls	All call events defined for the SI-IF8

## 1.4 Abbreviations

Term	Description
ARP	Alternative Roaming Provider
BS	Bearer Service
DSP	Domestic Service Provider
GPRS	General Packet Radio Service
GGSN	Gateway GPRS Support Node
GSM	Global System for Mobile communications (originally Groupe Spécial Mobile)
GSMA	GSM Association
HPMN	Home PMN
IF	Interface
IMEI	International Mobile station Equipment Identity
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
LTE	Long Term Evolution
MCC	Mobile Country Code
MNC	Mobile Network Code
MO	Mobile Originated
MOC	Mobile Originated Call
MSISDN	Mobile Station International Subscriber Directory Number

Term	Description
MT	Mobile Terminated
MTC	Mobile Terminated Call
NI	Network Identification
NRTRDE	Near Real Time Roaming Data Exchange
OI	Operator Identification
PMN	Public Mobile Network
PRD	Permanent Reference Document
RFC	Request for Comments
SGSN	Serving GPRS Support Node
SI	Single IMSI
SMS	Short Message Service
SMSC	Short Message Service Centre
TADIG	Transferred Account Data Interchange Group
TAP	Transferred Account Procedure
TS	Teleservice
UTC	Universal Time Co-ordinated
VPMN	Visited PMN

## 1.5 References

Ref	Doc Number	Title
[1]	GSMA PRD BA.20	Fraud Prevention Procedures
[2]	GSMA PRD TD.28	File Transfer Methods
[3]	GSMA PRD TD.35	NRTRDE Format Specification
[4]	RFC 2119	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997. Available at <a href="http://www.ietf.org/rfc/rfc2119.txt">http://www.ietf.org/rfc/rfc2119.txt</a>

## 1.6 Conventions

The key words "must", "must not", "required", "shall", "shall not", "should", "should not", "recommended", "may", and "optional" in this document are to be interpreted as described in RFC 2119 [4].

# 2 General Requirements

## 2.1 Considerations If Not Implementing This Interface

If the DSP chooses not to implement this interface according to the requirements in this section, it is liable (towards the ARP) for any related proven roaming fraud. It is recognised that the DSP could have implemented other methods to combat roaming fraud, or (in case the VPMN has failed to comply with the NRTRDE process towards the HPMN) liability for the fraudulent calls could be transferred to the VPMN.

## 2.2 Requirements On Top Of On-line Interfaces

The DSP must always forward to the ARP SMS-MO records where a third party SMSC is used (due to a potential fraud concern), even where on-line (real-time) interfaces are in place.

## 2.3 Requirements Where No On-line Interfaces Exist

Where there are no on-line (real-time) retail charging interfaces with the ARP, the DSP must forward to the ARP MOC, MTC and SMS-MO records for all services/destinations that are being managed by the ARP.

## 2.4 Additional Provisions

The NRTRDE data needs to be sent to the current ARP for that customer as per the start time of the call event.

Sending of other NRTRDE data not listed as mandatory in sections 2.2 and 2.3 (for example SMS-MT and GPRS data) is optional and at the discretion of the DSP. Unless otherwise agreed between the DSP and the ARP, the DSP is doing this on a best efforts basis and only in the interest of helping the ARP stop fraud, however it is not liable in the event that it fails to comply with the NRTRDE rules (for example timescales).

For the purpose of fraud prevention, the DSP is also allowed to analyse the NRTRDE data sent to the ARP. The DSP and ARP should agree on how to manage the fraud process.

The source of the NRTRDE data can be the NRTRDE data received from the VPMN, or any other information (for example SMSC or home GGSN information) at the discretion of the DSP.

## 3 Required Data Items

This section lists all required data items (names as in TD.35 [3]) per call scenario, and how they should be populated on the DSP to ARP interface.

### 3.1 File Level

Data Item	How to populate	Comments
Specification Version Number	Set to 2	
Release Version Number	Set to 1	
Sender	TADIG code of DSP	
Recipient	TADIG code of ARP	
Sequence Number	Maintain sequence numbers for the DSP/ARP relationship	
File Available Timestamp (including UTC Time Offset)	Set to the time when the file is sent	
Call Events Count	Calculate from individual call records	

**Table 1: File Level**

## 3.2 Call Detail Level

### 3.2.1 MOC

Data Item	How to populate	Comments
IMSI	IMSI	If MSISDN is not populated, then IMSI must be provided in full.  If MSISDN is populated, then population of the IMSI is at the discretion of the DSP (as a minimum the MCC/MNC of the HPMN/DSP must be populated).
IMEI	IMEI if available	
Call Event Start Timestamp (including UTC Time Offset)	Call Event Start Timestamp (including UTC Time Offset)	
Total Call Event Duration	Total Call Event Duration	
Cause for Termination	Cause for Termination	
TeleService Code	TeleService Code if available	One of TS or BS Code must be present
Bearer Service Code	Bearer Service Code if available	One of TS or BS Code must be present
Supplementary Service Code	Supplementary Service Code if available	Call forwarding indicator.
Dialled Digits	Dialled Digits if available	
Connected Number	Connected Number if available	For SMS-MO, this will contain the SMSC address.
Third Party Number	Third Party Number if available	
Recording Entity Identification	Recording Entity Identification	Populate with real Recording Entity Identification if available.  If not available, populate with UNKNOWN or VPMN TADIG Code
Call Reference	Call Reference or Message Reference where available	
Serving Network	If Serving Network is present in the incoming record, then populate with that. Otherwise populate with the TADIG code of the VPMN.	
MSISDN	MSISDN	Populate if available.

**Table 2: MOC**

### 3.2.2 MTC

Data Item	How to populate	Comments
IMSI	IMSI	If MSISDN is not populated, then IMSI must be provided in full.  If MSISDN is populated, then population of the IMSI is at the discretion of the DSP (as a minimum the MCC/MNC of the HPMN/DSP must be populated).
IMEI	IMEI if available	
Call Event Start Timestamp (including UTC Time Offset)	Call Event Start Timestamp (including UTC Time Offset)	
Total Call Event Duration	Total Call Event Duration	
Cause for Termination	Cause for Termination	
TeleService Code	TeleService Code if available	One of TS or BS Code must be present
Bearer Service Code	Bearer Service Code if available	One of TS or BS Code must be present
Calling Number	Calling Number if available	For SMS-MT, this will contain the SMSC address.
Recording Entity Identification	Recording Entity Identification	Populate with real Recording Entity Identification if available.  If not available, populate with UNKNOWN or VPMN TADIG Code
Call Reference	Call Reference or Message Reference where available	
Serving Network	If Serving Network is present in the incoming record, then populate with that. Otherwise populate with the TADIG code of the VPMN.	
MSISDN	MSISDN	Populate if available.

**Table 3: MTC**

### 3.2.3 GPRS

Data Item	How to populate	Comments
IMSI	IMSI	If MSISDN is not populated, then IMSI must be provided in full.  If MSISDN is populated, then population of the IMSI is at the discretion of the DSP (as

Data Item	How to populate	Comments
		a minimum the MCC/MNC of the HPMN/DSP must be populated).
IMEI	IMEI if available	
Call Event Start Timestamp (including UTC Time Offset)	Call Event Start Timestamp (including UTC Time Offset)	
Total Call Event Duration	Total Call Event Duration	
Cause for Termination	Cause for Termination	
Access Point Name NI	Access Point Name NI	
Access Point Name OI	Access Point Name OI if available	
Data Volume Incoming	Data Volume Incoming	
Data Volume Outgoing	Data Volume Outgoing	
SGSN Address	SGSN Address	Populate with real SGSN Address if available. If not available, populate with "1.1.1.1".
GGSN Address	GGSN Address	Populate with real GGSN Address if available. If not available, populate with "1.1.1.1".
Charging Id	Charging Id	
Serving Network	If Serving Network is present in the incoming record, then populate with that. Otherwise populate with the TADIG code of the VPMN.	
MSISDN	MSISDN	Populate if available.

**Table 4: GPRS**

## 4 Physical Format

The physical format is standard NRTRDE as defined in TD.35 [3].

## 5 File Names

The file naming convention should follow the NRTRDE standard:

NR[DSP TADIG code][ARP TADIG code][Sequence number]

Example: NRLUXPTLUXAR0012345

The ARP will need to use an in-country TADIG code, whether it has a registered in-country presence or not. The GSMA issues TADIG codes, and there are plenty of codes available within each European country. For the avoidance of doubt, if the ARP is also a MNO with international roaming agreements, it cannot reuse that TADIG code in its role as an ARP.



## **6 Timescales and Liability**

The timescale for the VPMN to make the NRTRDE records available to the HPMN is 4 hours from call/partial end time. As at least some of the information will be sourced from the incoming NRTRDE files, the HPMN will need additional time to make the records available to the ARP (potentially via a MVNO).

The DSP must make correct NRTRDE records (subject to the requirements in section 2) available to the ARP within 8 hours from call/partial end time. The additional 4 hours is needed to cater for exceptional cases of operational problems, validation, re-rating, transfer via a MVNO, etc. The actual time can also be shorter than 8 hours as agreed between the DSP and ARP.

The liability rules that apply to the VPMN and HPMN over the VPMN/HPMN interface as defined in BA.20 [1], apply also to the DSP and ARP over the DSP/ARP interface. The two interfaces are independent of one another.

## **7 Error Reports and File Delivery Reports**

File Delivery Reports and Error Reports as defined in TD.35 [3] are mandatory on the VPMN/HPMN interface, and must (as requested by the Fraud Forum) also be used over the DSP/ARP interface. If not implemented, then the ARP will accept the data as sent by the DSP.

## **8 File Exchange Rules**

Physical transfer methods are discussed in TD.28 [2].

## Document Management

### Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	27 Nov 2013	New PRD Created by the BEREC Stakeholder Forum Billing & Provisioning Subgroup	TADIG eVote PSMC #118	Christer Gullstrand / Syniverse

### Other Information

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