IR.85 IREG Hubbing Provider Data, Structure and Updating Procedures

Version 2.2

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1 Introduction

1.1 Scope of document

In order to have a common and easy overview of the most important data related to international roaming and interworking via HUB provider, the network data related to the HUB will be exchanged according to the procedures described in this document.

1.2 Glossary

Term	Description
APN	Access Point Name
ASN	Autonomous System Number
CAMEL	Customized Applications for Mobile networks using Enhanced Logic
CAP	CAMEL Application Part
CC	Country Code
Client Operator	A Public Mobile Operator that wishes to enter into a commercial relationship with a HUB in order to have international roaming with other operators
Connected Operator	A Public Mobile Operator which is connected to the client operator trough their HUB or to a third party Roaming Hubbing provider
DNS	Domain Name Service
ETS	European Telecommunications Standard
ETSI	European Telecommunications Standards Institute
GPRS	General Packet Radio Service
GSMA	GSM Association
GRX	GPRS Roaming Exchange
GSN	GPRS Support Node
HQ	Headquarters
HUB	Hub Service Provider
IMSI	International Mobile Station Identity
IP	Internet Protocol
ITU	International Telecommunication Union
MAP	Mobile Application Part
MCC	Mobile Country Code
MGT	Mobile Global Title
MNC	Mobile Network Code
MSC	Mobile Services Switching Centre
MSISDN	Mobile Subscriber ISDN Number
NC	Network Code
NDC	National Destination Code

Term	Description
PC	Point Code
PMN	Public Mobile Network
RAEX	Roaming Agreement Exchange
SCCP	Signalling Connection Control Part
SMSC	Short Message Service Centre
SS7	Signalling System no. 7

1.3 References

Ref	Doc Number	Title
[1]	GSMA PRD IR.21	GSM Association Roaming Database, Structure and Updating

2 Data to be stored and exchange by the HUB database

In order to fulfil the obligation regarding the network configuration, testing and trouble shooting, the HUB will need to handle in an appropriate way all the data provided in the IR.21 [1] and the IR.85, including the following data:

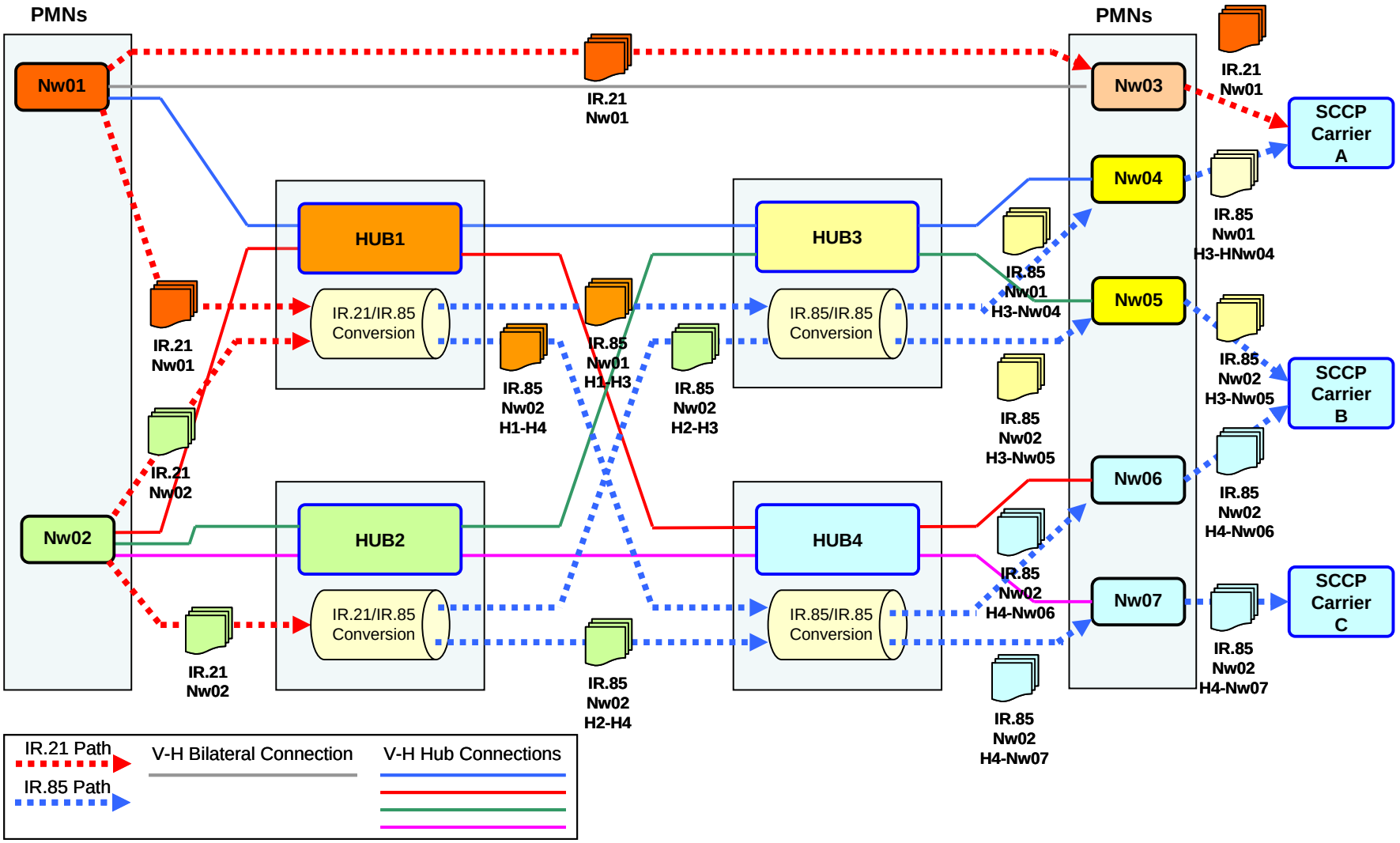
- The Organisation HUB name
- The Organisation HUB TADIG code
- The operator organisation name
- The operator network TADIG code
- IR.80 architecture

3 Reports

Specific reports can be provided by the HUB to their Client Operators.

4 Procedures for updating the HUB database

The below diagram illustrates the exchange data process:



As described in the above picture, the operators will send their IR.21 for the bilateral roaming to their roaming partner directly. Since the HUB must not produce extra work for the operator, and in order to guarantee that the operators' data is correctly configured in the HUB network, the operator will also send the IR.21 to their HUB. Since it is mandatory that the HUB will control 100 % of the signalling related to a roaming relation, the HUB will generate the IR.85 related to a roaming relation in order to guarantee the path between the two roaming partners.

- HUB[X] is representing the HUB TADIG code
- Nw[X] is representing the network operator TADIG code

1. Bilateral case: IR.21 will be used and this IR.85 PRD will not impact the bilateral process.
2. HUB relation between the network Nw01 and Nw04 through the HUB1 and HUB3:

    a) Nw01 sends his IR.21 to the HUB1 using the process described in the IR.21.
    b) The HUB1 will convert the IR.21 to the IR.85 version which will be used for the interconnection between the HUBs. The file name of this document will identify the connection between the HUB1 and HUB3.The file name will be IR85Nw01_HUB1_HUB3_YYYYMMDD_1_0 (See section 7.4 for file naming convention). In this file name, HUB1 is the TADIG code of the HUB 1 and HUB3 is the TADIG code of the HUB 3.
    c) On receiving this document, the HUB3 will in the same way convert it. The Nw04 will receive a document containing only the data needed for the configuration of his own network. The file name will be IR85Nw01_HUB3-Nw04_YYYYMMDD_1_0 (See section 7.4 for file naming convention). Nw04 will need to be able to receive the IR.85 of the roaming partner and handle it like the IR.21.

3. HUB relation between the network Nw01 and Nw06:

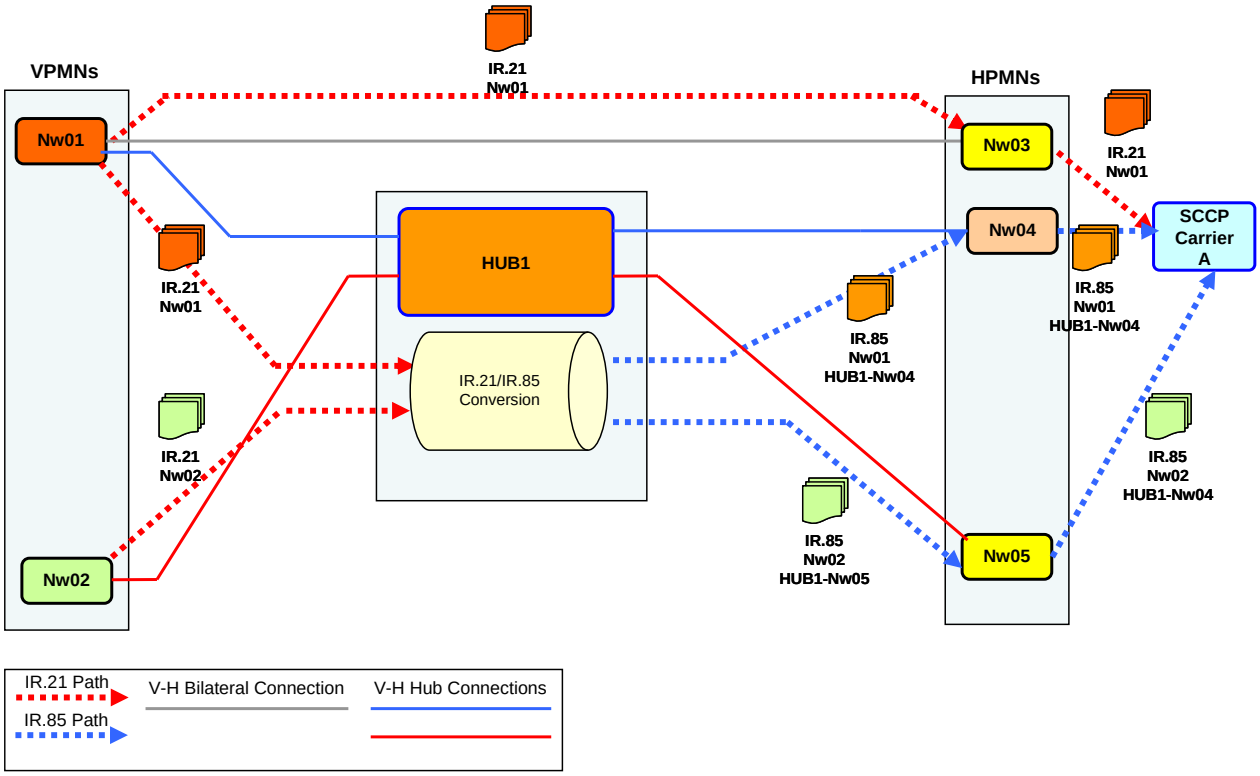
    a) If not already done so, the Nw01 will have to send his IR.21 to the HUB1
    b) The HUB1 will convert the IR.21 to the IR.85 version which will be used for the interconnection between the HUBs. The file name of this document will identify the connection: therefore between the HUB1 and HUB4. The file name will be IR85Nw01_HUB1_HUB4_YYYYMMDD_1_0 (See section 7.4 for file naming convention).
    c) On receiving this document, the HUB4 will in the same way convert it. The Nw06 will receive a document containing only the data needed for the configuration of his own network. The file name will be IR85Nw01_HUB4-Nw06_YYYYMMDD_1_0 (See section 7.4 for file naming convention).

4. HUB relation between the network Nw02 and Nw06:

    a) Nw02 send his IR.21 to the HUB2.
    b) The HUB2 will convert the IR.21 to IR.85 version which will be used for the interconnection between the HUBs. The file name of this document will identify the connection: for example between the HUB2 and HUB4, the file name will be IR85Nw02_HUB2_HUB4_YYYYMMDD_1_0 (See section 7.4 for file naming convention).

c) On receiving this document, the HUB4 will in same way convert it. The Nw06 will receive a document containing only the data needed for the configuration of his own network. The file name could be IR85Nw02_HUB4-Nw06_YYYYMMDD_1_0 (See section 7.4 for file naming convention).

The below diagram illustrates the data process in the case where only one (1) HUB is involved:



In case where relation (roaming or interworking) will be established through only one HUB, the process drawn in the above picture must be used. The process will be the same in case of Client Operators and Connected Operators.

1. HUB relation between the network Nw01 and Nw04 through the HUB1:

   a) Nw01 sends his IR.21 to the HUB1 using the process described in the IR.21.
   b) The HUB1 will convert the IR.21 to the IR.85 version which will be used by the operator Nw04. The file name of this document will identify the connection between HUB1 and the Nw04. The file name will be IR85Nw01_HUB1_NW04_YYYYMMDD_1_0 (see section 7.4 for file naming convention).

2. Relation between Nw02 and Nw05 through the HUB1; Nw02 is client operator and Nw05 is connected operator:

   a) Nw02 sends his IR.21 to HUB1 using the process described in the IR.21.
   b) The HUB1 will convert the IR.21 to the IR.85 version which will be used by the operator Nw04. The file name of this document will identify the connection between the HUB1 and the Nw04. The file name will be IR85Nw02_HUB1_Nw05_YYYYMMDD_1_0 (see section 7.4 for file naming convention).

A new version of the IR.85 can be triggered by one of the following events:

- IR.21 change
- A change of the IR.85 provided by the peered HUB.
- A change in the HUB architecture.

4.1 IR.21 change

In the case where an operator will change data in their IR.21, the operator will provide the IR.21 to their HUB following standard Client to HUB procedure. The HUB will make the appropriate IR.85 upgrade and propagate it to the peered HUB or roaming partner according to the agreement between the applicable parties. The IR.85 should contain revision information of the IR.21.

4.2 A change of the IR.85 provided by the peered HUB

When a relationship is established through two peered HUBs, the first HUB will be responsible to propagate the change to the second HUB using the appropriate updated IR.85. The second HUB will need to reflect the changes in the appropriate IR.85 and provide it to the Client / Connected Operator as applicable.

4.3 A change in the international hubbing network architecture

In the case where an operator is migrating from one HUB to another HUB or in the case where the HUB Signalling Connection Control Part (SCCP) provider is changed, the applicable IR.85 will need to be updated. The HUB will be responsible for the distribution of the updated IR.85 to the connected parties as applicable.

5 ANNEX A

RAEX IR.85 uses the RAEX IR.21 schema which is documented in the IR.21 PRD [1].

6 ANNEX B

6.1 Update schedule for the HUBs

Operators will have to send to their HUB the change of network using the process described in the Annex C, Section 7.2 of the binding PRD IR.21. The HUB will be responsible to populate and coordinate the implementation of this data according to the bilaterally agreed procedure. The updated data must be distributed by the HUB to the roaming partner latest ten (10) working days after the reception of the IR21.

7 Annex C

7.1 RAEX IR.85 BUSINESS REQUIREMENTS

As stated in the previous chapter, the operator will provide to their HUB their IR.21 data in accordance to the applicable GSMA PRDs.

The IR.85 data exchange will be executed electronically via XML file. Operators will be able to request this data in PDF format from the HUB.

RAEX IR.85 provides the means of exchanging the IR.85 using the pre-defined data format contained within this PRD and according to a standardised business processes represented here. The standard IR.85 will remain the legally binding document in the case where the roaming is established via a HUB.

Between HUBs it is mandatory that the IR.85 is exchanged using the XML format described below

RAEX IR.85, which when used should conform to the latest version of IR.21 /IR.85 in order to avoid loss of roaming partners' data.

7.2 RAEX IR.85 EXCHANGE PROCESS AND NOTIFICATION FUNCTIONALITIES

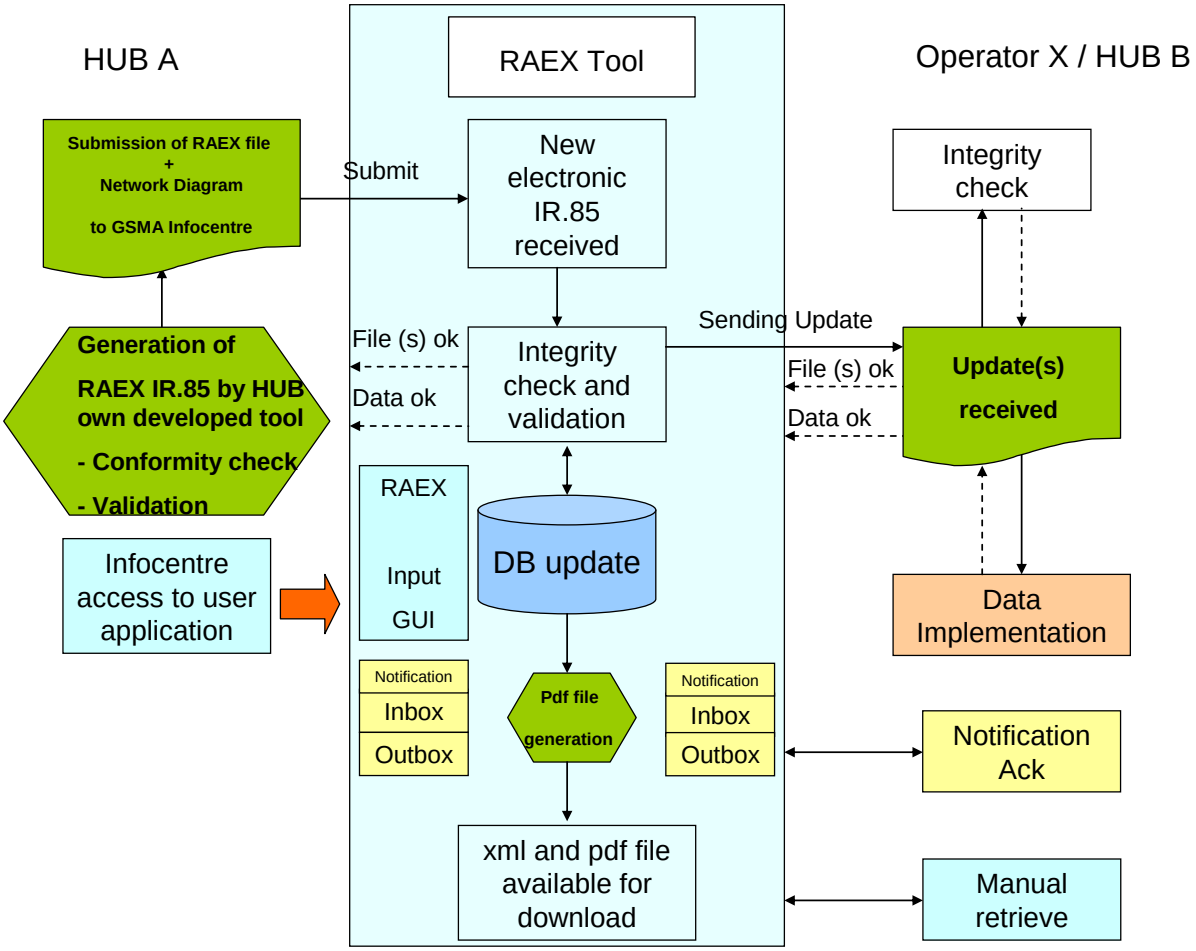
7.2.1 RAEX IR.85 Exchange Process

The HUB will be responsible to produce and distribute the IR.85 according the process described in the chapter 4 Procedures for updating the database. This data will be distributed to the relevant operator or HUB partner either using the RAEX Tool or using the own HUB developed tool. In all case the HUB will be responsible for the quality of the propagated data, however the operators will guaranty the quality of the data contained in the IR21.

In the case where the own tool will be used, the HUB will need to fulfil the operator requirement bilaterally agreed. These requirements are out of the scope of this document. In the case where the HUB will use the RAEX Tool, the HUB will be able to load the data with one of the following methods:

- The RAEX Tool GUI.
- To upload the xml file generate by the HUB.

The bellow picture is describing the usage of the RAEX Tool in order to distribute the IR.85 data.



7.2.2 Usage of the RAEX Tool GUI

The RAEX Tool GUI will allow the HUB upload manually the IR.85 data. Since the IR.85 is based on the IR21 or other IR85 document. It should be possible to import the data from the source document and modify only the data which need to be modified. In order to fulfil the notification process and support the multi version of the data, it will be needed to specify in the GUI the file name according to the chapter 7.5 File naming convention. A file name validation will need to be done.

7.2.3 Upload the xml file generate by the HUB

It can be that the HUB decides to generate the IR.85 with his own developed tool. In order to be able to fulfil the operators or partner HUBs requirement which would like to receive the IR.85 via the RAEX Tool, the HUB will be able to upload the XML file. The file name will need to be compliant with the chapter 7.5 File naming convention. A file name validation will need to be done.

7.2.4 RAEX IR.85 notification Process

The notification process needs to be implemented according to the chapter 4 of this document. Since the file name is containing the origin and the destination of the document, the IR85 will need to be distributed according to the originator and destination TAP code included in the file name. The file name will have the format described in the chapter 7.5 File naming convention. The format of the notification will be the following:

- Organisation and contact name providing the update (name of sending HUB)
- Alert number and URL to get access to the content
- Accessing the RAEX Tool page, operator / HUB may acknowledge the receipt and provide implementation feedback (that is implemented or planned [date]). This is represented by operator / HUB “outbox” section. This information is either transmitted back to the HUB who sent the update and stored into an “inbox” section for that HUB on the RAEX Tool.
- File Name of the IR.85 according to the format described in the chapter 7.5 File naming convention

7.3 ACCESS TO ROAMING DATA

RAEX Tool designated IR.85 administrators can access to Roaming Database for information retrieval. An operator or a HUB will be able to retrieve the appropriate information needed for configuration of their own network and in case of HUB generate the requested IR.85 data

At the same URL containing the query wizard, there is also the reference for downloading the entire IR.85 in XML or PDF versions.

7.4 COMPANY LOGO

Every HUB is allowed to upload his own and corresponding operator logo if requested on the RAEX Tool. The logos could be provided as a JPG file and will be automatically integrated into the PDF file while converted with the XML schema. The name of the file shall be logohub.jpg and logooperator.jpg. The logos can be as well loaded on the GUI if requested.

7.5 FILE NAMING CONVENTION

Naming convention is applied to RAEX IR.85 file. It contains at least the following information:

- Operator TADIG code.
- Sender HUB TADIG code
- Recipient TADIG code
- IR.21 issue date information
- IR.85 issue date information
- Sequence Number

The file name format will be the following:

IR85_XXXXX_HHHHH_YYYYY_DDMMYYYY_ZZ

Where:

- XXXXX is the operator TADIG code.
- HHHHH is the HUB TADIG code.
  -YYYYY is the recipient TADG code which can be an operator or a HUB.
- DDMMYYYY is the date where the IR.21 was issued.
- Sequence number will be a number to identify uniquely an IR.85 in case it is needed to revise it.

7.6 VERSION CONTROL AND CHANGELOG

Main reference for IR.85 data is Annex A. Every potential change/addition to data structure and definition, with principles of Change Request process, will mirror changes in RAEX structure. Revision control mechanism in use is still valid and also applied for RAEX sections.

A general Change Log is automatically populated.

It is defined by the following fields:

- Referenced IR.21 information
- Date
- Description

The HUB must at all times use the latest version of IR.21 or IR.85 (where the file is received from the peered HUB) to generate the IR.85. In order to avoid any lack of data or fields into their networks a version control mechanism is maintained by the HUB.

7.7 STRUCTURE OF DATA

This paragraph shows the structure of the sections included within IR.85 Annex A with the purpose of:

1. Characterize sections with a tag (mandatory, optional, conditional).
2. Define dependencies between sections, if any.
3. Identify correctly the section name.

In consideration of new services still in a design stage and scenarios already live (that is network extensions), it is proposed to structure the IR.85 information considering these new services and to base the identification of a PMN with the IMSI associated as described in the image attached.

Major level of the structure contains operator general information, the “organisation name” that manages a single or a group of PMNs, major identified with the element “network” (level 1). Unique reference in this network level, according to IMSI and MGT information, is the TADIG code, managed and released by GSMA to every PMN.

Every PMN has a major definition with the fields IMSI and MGT/HUB MGT and with the possibility of having multiple IMSI series translated in a single MGT/HUB MGT. At the same level, a differentiation by NDC is represented with the right parameters associated. This is required to serve those PMNs who are indicating different SCCP GW destinations for their E.164 ranges.

Every operator will have as many different network data blocks as the pair of IMSI / MGT (HUB MGT) series they have.

Representation of extended and non-terrestrial network will be given by a new section named “Hosted Networks”.

7.8 RELEASE MANAGEMENT

7.8.1 RAEX IR.85 change management

Changes in the RAEX IR.85 process have implications in other PRDs such as TD.85. Release management procedures must be aligned for all GSMA data interchange formats, in order to provide implementation time and rules for testing and migration. IDS is the Working Group within the GSMA responsible for the specification and maintenance of data interchange formats.

Therefore, RAEX IR.85 release management process will be aligned to the one already defined and in place within the IDS Working Group.

The Release Management principles for RAEX IR.85 are defined in the Permanent Reference Document (PRD) TD.34

The table below summarizes the timescales for the “RAEX IR.21 Scheduled Releases” according to chapter 2.1 of TD.34:

Format	Submission of Major Req’s	Approval of Major Changes	Submission of Minor Req’s	Approval of Minor Changes	Latest Implem. Date
RAEX IR.85	15 March	15 May	15 September	15 November	1 May

7.8.2 RAEX IR.85 Version Control

When a new IR.85 is released a new version of RAEX Business Requirements and related IDS documentation will also be created and HUBSs and operator will need to support a new RAEX IR.85 version. It may also occur that development of TD documents may in turn create a change to RAEX IR.85. These changes are indicated using a latest version number.

Senders and receivers of IR.85 data in the new RAEX IR.85 version will need to make a change to their systems in order to create/accept any new information being exchanged in the newer RAEX IR.85 version.

HUBs will need to indicate in their IR.85 ID.3 network information, which version of RAEX IR.85 they will ’send’ to and can ‚receive’ from their partners in order for them to understand what version of RAEX IR.85 is being supported by that HUB.

EXAMPLE: RAEX IR85 2010 All HUBs and SPs must use the most recent of RAEX IR85.

In exceptional case it could be that an operator is not supporting the latest RAEX IR85 version; in such case the HUB will need to send to his client operator the bilaterally agreed version.

8 IR.85 DATA DICTIONARY

IR.85 data dictionary is defined in IR.21 PRD [1].

Document management

Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
08.04.2009	V 0.1	First Draft Philippe Erard	RAEXTF	Philippe Erard/ Comfone Ltd
28.05.2009	V0.2	Ready for review by RAEXTF	RAEXTF	Philippe Erard/ Comfone Ltd
22.06.2009	V0.3	Ready for review by signal and IRHG	SIGNAL & IRHG	Philippe Erard/ Comfone Ltd
22.09.2009	V0.4	Add IRHG/signal comment ready for IREG approval	IREG	Philippe Erard/ Comfone Ltd
14.10.2009	V0.5	Add IREG mailing list comment	IREG	Philippe Erard/ Comfone Ltd
27.10.2009	V0.6	Additional editorial comments by signal	SIGNAL	Philippe Erard/ Comfone Ltd
28,10.2009	V1.0	Clean version with template for new PRD	IREG & EMC	Philippe Erard/ Comfone Ltd
01.02.2011	V1.1	Introduction of the MCR01	IREG & EMC	Philippe Erard/ Comfone Ltd
29.10.2012	V2.0	Introduction of MCR02 approved on 23rd Nov 12	IREG PSMC #108	Philippe Erard (Comfone Ltd.
10.03.2015	V2.1	Inclusion of CR1001 approved on 10th March 2015	NG e-vote	Mihaela Ambrozie/ Vodafone Roaming Services
26/4/2024	V2.2	Inclusion of CR1002 / 1003 / 1004 (Alignment with IR.21 PRD R17)	NG	Marc Balon (Orange)

Other Information

Type	Description
Document Owner	IREG
Document editor/company	Mihaela Ambrozie (Vodafone Roaming Services)

Feedback

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