

GSMA Working Groups LinkedIn Live

IR.21: Advancing Interoperability in roaming

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Agenda

Today's LinkedIn Live session will cover:

- **IR.21 New Release and Implementation**
- **Advancing Interoperability in roaming**

Q&A

Please share your questions in the chat.



Olu Oke

Standardisation Working Group Director
GSMA



Fabrizio Fiorucci

Roaming Engineer
TIM



Javier Sendin

Technical Director
GSMA



Olu Oke

Standardisation Working Group Director

GSMA

IR.21 New Release and Implementation

New Features of IR.21/RAEX

What is IR.21? Why is it needed?

- IR.21 is a document designed to contain all needed Network information for exchange among Companies, in order to support Roaming and Interworking services. IR.21 v18 was recently published.
- Operators can choose who to make their data available to (e.g. full data may be provided to a Roaming Partner whilst partial data may be provided to Non-Roaming Partners).
- GSMA has developed a Tool called **Roaming Agreements EXchange (RAEX)** to exchange this information in a secure environment.
- A New Release of RAEX is expected at the end of March 2026, with its UAT to hold between **23/2 and 08/3/2026**. This webinar will highlight additional features expected in this version.
 - Companies interested in taking part in the UAT should contact ooke@gsma.com and jsendin@gsma.com.



Networks Group

IR.21/RAEX: Categories of Changes made

**Changes Due to the New
RAEX IR.21 Schema**

**Roaming Gateway
Usability Improvements**

**Change Due to New
Operational Data
Requirements**

Changes were made based on member input

Changes due to the New RAEX IR.21 Schema

Examples of New RAEX IR.21 Schema Changes:

**Add Roaming Protection
Section**

**Improve Support for Satellite
Operators**

**New Section for Emergency
Services**

**Rename SMS Interworking
and Introduce Network Type
checks**

**Contacts section
improvement**

**Additional Emergency Call
Configurations and New
Report**

1) Add Roaming Protection Section

Section 31 (Roaming Protection)

- New optional “Roaming Protection” section
- Single subsection “Inbound Roaming Protection”
 - Technology (SS7, Diameter, GTP, HTTPS)
 - Protection Coverage (All, Partial, Not disclosed)
 - Comment (Optional)

Impact: User interface, RAEX format, PDF representation, import/export

The screenshot displays the GSMA IR.21 user interface. The top navigation bar includes 'GSMA IR.21', 'Home', 'Inbox', 'Archive', 'Drafts', 'Distributed', 'Distribution Lists', 'Catalog', and 'Reports'. The user is logged in as '***Test RAEX Operator A' with 80 notifications. The main content area is titled 'Drafts > IR.21 18.0 Example'.

On the left, a 'Network' sidebar lists various sections, with '31 Roaming Protection' selected. The main panel shows the configuration for '31 Roaming Protection', which is currently 'Enable'. Below this, there is a section for 'Effective date of change and change history (2016-08-19)'. The 'Inbound Roaming Protection' section contains a table with the following data:

Technology	Protection Coverage*	Comment
SS7 (2G/3G)	All Partial Not disclosed	Firewall active at interconnect
Diameter (4G)	All Partial Not disclosed	Signalling firewall covers key interfaces
GTP (2G/3G/4G)	All Partial Not disclosed	GTP-C/GTP-U inspection enabled
HTTPS (5G)	All Partial Not disclosed	

At the bottom of the interface, there are 'Delete', 'Validate', and 'Save' buttons, along with version information: '©Roamsys Version 47.0.0 b1082'.

2) Improve Support for Satellite Operators

The screenshot displays the GSMA IR.21 web interface. The top navigation bar includes 'GSMA IR.21', 'Home', 'Inbox', 'Archive', 'Drafts', 'Distributed', 'Distribution Lists', 'Catalog', and 'Reports'. The main content area is titled 'Drafts > IR.21 18.0 Example'. On the left, there is a sidebar with a 'General Information' section and a list of network types. The main content area is divided into two sections: '1 Organisation' and '2 Network'. The '1 Organisation' section includes a 'File header' with fields for 'File type*' (IR.21), 'Sender TADIG code*' (ROAMI), 'Publish comment*' (Schema version 18.0), 'TADIG generic schema version*' (2.4), and 'IR.21 schema version*' (18.0). Below this is the 'Organisation' section with fields for 'Organisation*' (***Test RAEX Operator A) and 'Country*' (Ireland). The '2 Network' section includes a 'TADIG summary' table with columns for 'MCC*', 'MNC*', and 'VPMN / HPMN*'. A dropdown menu is open, showing options for network type, with 'Satellite/Space' highlighted. The bottom of the interface shows the version 'Roamsys Version 47.0.0' and a 'Save' button.

Change Improves support for NTN (*Non-Terrestrial Networks*) and inbound-only roaming operators

- **Section 1 (Organisation)**
 - Add new **network type** “Satellite/Space” to TADIG summary
- **Section 2 (Network)**
 - Add new **coverage** option “Global” for all frequencies

Impact: RAEX format, import/export



3) New Section for Emergency Services

- Emergency Services information shall be moved from section **26 VoIMS Roaming** to a new section **30 Emergency Services**.
- The new section shall be non-confidential, i.e. its data cannot be hidden from the IR.21 catalog and reports.
- The new section shall contain the complete Emergency Calls subsection from section 26 VoIMS Roaming.
- The confidentiality of this information is updated to support the provision of essential services that aid non-GSMA members in the delivery of Emergency services.

The screenshot displays the GSMA IR.21 management interface for the '30 Emergency Services' section. The interface is organized into several functional areas:

- General Information:** Includes 'Enable', 'Disable', and '+ Show All' buttons.
- Effective date of change and change history (2018-08-01):** A section for tracking updates.
- Emergency Calls:** Contains configuration options for VPLMN technology strategy (VoLTE, VoNR, CS Fallback) and various emergency call scenarios (MME announce, AMF announce, VPLMN accepts unauthenticated IMS, VPLMN accepts IMS without UICC) with 'Yes' and 'No' selection buttons.
- Local emergency numbers in use at the VPMN:** Includes 'Enable', 'Disable', and '+ Show All' buttons.
- Real-Time Text (RTT):** Features a 'VPMN natively supports GTT-IP / RTT for emergency services*' toggle (Yes/No) and 'Enable', 'Disable', and '-' buttons.
- Numbers to access the emergency center via GTTP-IP / RTT:** A table with columns for 'Number*' and 'Service*'. An example entry shows '115' for 'TTY Fire Assistance'. Includes '+ Add' and '-' buttons.
- eCall:** Includes a 'VPMN technology strategy for eCall*' toggle (None, eCall, NG eCall) and 'Enable', 'Disable', and '-' buttons.
- Advanced Mobile Location (AML):** Features a 'VPMN technology strategy for AML*' toggle (None, SMS, HTTP) and 'Enable', 'Disable', and '-' buttons.
- Emergency numbers that trigger the sending of location information via AML:** A table with columns for 'Number*' and 'Service*'. An example entry shows '112' for 'General Emergency'. Includes '+ Add' and '-' buttons.

The interface footer shows '©Roamsys Version 47.0.0 b1082' and 'Validate Save' buttons.

4) Rename SMS Interworking and Introduce Network Type checks

The screenshot displays the GSMA IR.21 configuration tool. The main area is titled '1 Organisation' and contains several sections: 'File header' with fields for File type (IR.21), Sender TADIG code (ROAM1), Publish comment, TADIG generic schema version (2.4), and IR.21 schema version (18.0). Below this is the 'Organisation' section with fields for Organisation (***Test RAEX Operator A) and Country (Ireland). A 'TADIG summary' section follows. The 'ROAM1' section includes a table for adding network types with columns for MCC, MNC, and VPMN/HPMN. A dropdown menu is open over this table, listing 'Basic Network Types' (Terrestrial, Non-Terrestrial (Aerial), Non-Terrestrial (Maritime), Satellite/Space, MVNO (Full)) and 'Additional Network Types' (M2M Dedicated Operator (M2MDO), M2M Integrated Solution (M2MIS), Multi MCC-MNC (IMSI), MVNO (Light), Network Sharing (MOCN), Network Extension). The 'Terrestrial' option is selected. The footer shows '©Roamsys Version 47.0.0' and 'Validate Save' buttons.

- **Section 1 (Organisation)**
 - Introduce new network type checks
 - M2M Dedicated Operator (M2MDO), M2M Integrated Solution (M2MIS), MVNO (Full), Multi MCC-MNC (IMSI) and MVNO (Light) must always be **HPLMN**.
 - Non-Terrestrial (Aerial), Non-Terrestrial (Maritime), Network Sharing (MOCN), Network Extension must always be **VPLMN**.
 - Network types are now visibly grouped into *Basic* and *Additional* network types, improving data quality.
 - One MCC/MNC must not be allocated to multiple basic network types
- **Section 23 (M2M Roaming)**
 - Make only remaining subsection “Sub range IMSIs” mandatory
- **Section 29 (SMS Roaming)**
 - Rename subsection “SMS Interworking” to “SMS Exchange”



5) Contacts section improvement

The screenshot displays the 'Contacts' configuration page in the GSMA IR.21 system. The left sidebar shows a tree view of system components, with '21 Contacts' selected. The main panel is divided into several sections: 'Effective date of change and change history (2016-08-11)', 'Roaming troubleshooting contacts' (set to 'Neverland'), 'Roaming troubleshooting ticketing system information' (with fields for 'Ticketing system web address' and 'Ticketing system email address', and a dropdown for 'Troubleshooting receipt preference*'), and 'IR.21 distribution email address'. At the bottom, there are lists for 'SCCP inquiries and ordering contacts*', 'Roaming coordinator contacts*', 'IREG testing contacts*', and 'TADIG testing contacts*', each with a dropdown menu showing names like 'Curie, Marie' and 'Jordan, Michael'. A 'Save' button is visible at the bottom right.

- Fixed and mobile phone numbers have been merged
- Each contact must have at least a phone number *or* an email address
- Mandatory contacts **must** have both. This will enhance the reachability of contacts.
- You can use persons *or* teams for each of the available contacts
- A new troubleshooting receipt preference has been added



6) Additional Emergency Call Configurations and New Report

26 VoIMS Roaming continuity eSRVCC Enable Disable + Show All

S8HR/N9HR roaming constraints Enable Disable -

Lawful interception* Yes No

EPS QoS to be enforced* 15

Emergency Calls

VPLMN technology strategy for emergency calls* VoLTE VoNR CS Fallback

MME announce the emergency number list toward inbound roamer's UE* Yes No

AMF announce the emergency number list toward inbound roamer's UE* Yes No

VPLMN accepts unauthenticated IMS emergency call?* Yes No

VPLMN accepts IMS emergency call without UICC?* Yes No

Additional emergency call configurations shall be added.

- **Section 26 (VoIMS Roaming)**

- New mandatory option “VPLMN accepts unauthenticated IMS Emergency call?” (Yes / No)
- New mandatory option “VPLMN accepts IMS Emergency call without UICC?” (*Universal Integrated Circuit Card*) (Yes / No)

- **IR.21 Reports**

- Add new options to new Emergency Calls reports
 - VPLMN accepts unauthenticated IMS Emergency call
 - VPLMN accepts IMS Emergency call without UICC
- Add new report for local emergency numbers in use at the VPLMN
 - Number
 - Service
 - URN (*Uniform Resource Name*) information (list)

Additionally... Packet Data and GPRS Data have been split ...

Packet and GPRS (*General Packet Radio Service*) Data have been split into two sections 16.1 and 16.2, serving to provide better clarity:

The screenshot shows the GSMA IR.21 web interface for configuration. The left sidebar lists various network services, with '16.1 Packet Data Services' selected. The main content area is titled '16.1 Packet Data Services' and includes several sections, each with an 'Enable' button and a '+ Show All' link:

- Effective date of change and change history (2016-08-19) +
- APN operator identifiers +
- WEB APNs available for testing and troubleshooting (Enable) (Disable) +
- WAP APNs available for testing and troubleshooting (Enable) (Disable) +
- MMS APNs available for testing and troubleshooting (Enable) (Disable) +
- M2M APNs available for testing and troubleshooting (Enable) (Disable) +

At the bottom, there are 'Delete', 'Validate', and 'Save' buttons. The footer indicates '©Roamsys Version 47.0.0 b1082'.

The screenshot shows the GSMA IR.21 web interface for configuration. The left sidebar lists various network services, with '16.2 GPRS Data Network' selected. The main content area is titled '16.2 GPRS Data Network' and includes several sections, each with an 'Enable' button and a '+ Show All' link:

- Effective date of change and change history (2016-08-19) +
- GTP Versions +
- Supported data services (Enable) (Disable) +
- Multiple PDP Context and IPv6 Connectivity Information +
- VPMN Support of Local Breakout (Enable) (Disable) +
- 2G/3G QoS profiles (Enable) (Disable) +

At the bottom, there are 'Delete', 'Validate', and 'Save' buttons. The footer indicates '©Roamsys Version 47.0.0 b1082'.

Roaming Gateway Usability Improvements

1) RAEX Tools Usability Improvements

1) No more default values for elements within the following Sections, requiring users to complete all fields thus helping to improve overall data quality:

2 Network	4 Routing	5 International SCCP Gateway	7 SCCP Protocol Available at PMN	8 Subscriber Identity Information
14 USSD	15 CAMEL	16 Packet Data Services	18 MMS Interworking	20 LTE Roaming
22 Hosted Networks	26 VoIMS Roaming	27 LPWA Roaming	28 5G SA Roaming	29 SMS Roaming

29 SMS Roaming

- o SMS over IP (Supported / Unsupported)
- o SMS over NAS via SS7 (Supported / Unsupported)
- o SMS over NAS via diameter (Supported / Unsupported)
- o SMS over NAS via HTTPS (Supported / Unsupported)

22 Hosted Networks

- o Network type (Terrestrial / Non-Terrestrial / ...) – Select box

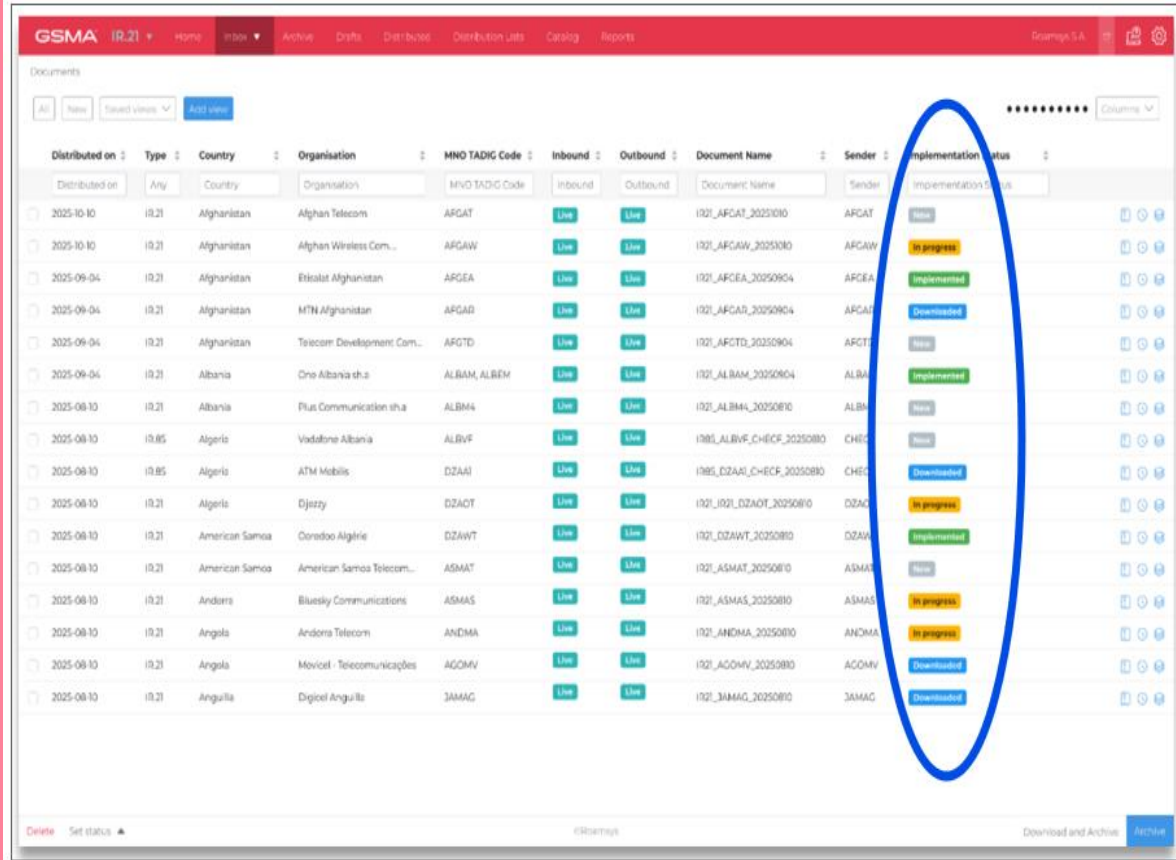
2 Networks

- o Service Status - Planned Closure and Availability (Radio Network) (Supported/ Unsupported)
- o Service Status - Planned Closure and Availability (Core Network) (Supported / Unsupported)
- o 2G-GSM frequencies (Supported / Unsupported)
- o 3G-UTRA/FDD frequencies (Supported / Unsupported)
- o 3G-UTRA/TDD frequencies (Supported / Unsupported) ...

RAEX Tools Usability Improvements (Contd.)

2) Add IR.21 implementation status:

- The **IR.21 Inbox and Archive** sections shall be enhanced to support an **IR.21 implementation status** which shall be shared across **sender and receiver of an IR.21 document**. The status values shall be the following: “New” (Default), “Downloaded”, “In Progress”, “Implemented”, “Rejected”. The Archive section shall show the latest implementation status for each operator on the overview and a detailed status for each received document on the details page.
- When downloading one or multiple documents from the Inbox, a dialog shall ask if the IR.21 implementation status shall be updated. “**Downloaded**” should indicate that a document has been received by the roaming partner, while “**In Progress**” indicates that the actual implementation has started. This could also be set via API, e.g. if the download of a file triggers a configuration update. The same actions shall be possible from the Archive overview as well as from the Archive details pages.



The screenshot displays the GSMA IR.21 interface, showing a table of documents. The table has columns for Distributed on, Type, Country, Organisation, MNO TADG Code, Inbound, Outbound, Document Name, Sender, and Implementation Status. The Implementation Status column is highlighted with a blue oval, showing various status values such as 'New', 'In progress', 'Implemented', and 'Downloaded'.

Distributed on	Type	Country	Organisation	MNO TADG Code	Inbound	Outbound	Document Name	Sender	Implementation Status
2025-10-10	IR.21	Afghanistan	Alghan Telecom	AFGAT	Live	Live	IR21_AFGAT_20251010	AFGAT	New
2025-10-10	IR.21	Afghanistan	Alghan Wireless Com...	AFGAW	Live	Live	IR21_AFGAW_20251010	AFGAW	In progress
2025-09-04	IR.21	Afghanistan	Etikolat Afghanistan	AFGEA	Live	Live	IR21_AFGEA_20250904	AFGEA	Implemented
2025-09-04	IR.21	Afghanistan	MTN Afghanistan	AFGAD	Live	Live	IR21_AFGAD_20250904	AFGAD	Downloaded
2025-09-04	IR.21	Afghanistan	Telecom Development Com...	AFGTD	Live	Live	IR21_AFGTD_20250904	AFGTD	New
2025-09-04	IR.21	Albania	One Albania ths	ALBAM, ALBEM	Live	Live	IR21_ALBAM_20250904	ALBAM	Implemented
2025-08-10	IR.21	Albania	Plus Communication ths	ALBMA	Live	Live	IR21_ALBMA_20250810	ALBMA	New
2025-08-10	IR.85	Algeria	Vodafone Albania	ALBVF	Live	Live	IR85_ALBVF_CHECK_20250810	CHECF	New
2025-08-10	IR.85	Algeria	ATM Mobilis	DZAAI	Live	Live	IR85_DZAAI_CHECK_20250810	CHECF	Downloaded
2025-08-10	IR.21	Algeria	Djerzy	DZAOI	Live	Live	IR21_DZAOI_20250810	DZAOI	In progress
2025-08-10	IR.21	American Samoa	Doradoo Algérie	DZAWT	Live	Live	IR21_DZAWT_20250810	DZAWT	Implemented
2025-08-10	IR.21	American Samoa	American Samoa Telecom...	ASMAT	Live	Live	IR21_ASMAT_20250810	ASMAT	New
2025-08-10	IR.21	Andors	Bluesky Communications	ASMAS	Live	Live	IR21_ASMAS_20250810	ASMAS	In progress
2025-08-10	IR.21	Angola	Andora Telecom	ANDMA	Live	Live	IR21_ANDMA_20250810	ANDMA	In progress
2025-08-10	IR.21	Angola	Movicol - Telecomunicações	ACOMV	Live	Live	IR21_ACOMV_20250810	ACOMV	Downloaded
2025-08-10	IR.21	Anguilla	Digicel Anguilla	JAMAG	Live	Live	IR21_JAMAG_20250810	JAMAG	Downloaded

RAEX Tools Usability Improvements (Contd.)

2) Add IR.21 implementation status Contd:

- The “Set status” dialog shall include a text field for providing feedback to the sender of the distributed document (e.g., “There is an error in the IMSI translation table.”). This feedback will appear as a comment on the sender’s document, using the same mechanism already in place for deleted documents.
- The **Distributed details section** for a document shall show the IR.21 implementation status for each recipient. If comments have been entered by the recipients, these shall be shown in the “Comment” column.

The screenshot displays the 'Distributed' section of the GSMA IR.21 interface. The top navigation bar includes 'Distributed' (circled in blue), 'Distribution Lists', 'Catalog', and 'Reports'. Below the navigation, the document details for 'IR.21 Update September 2025' are shown, including the distributed filename, type, distribution date, and type. A progress bar at the top right indicates the status of the document: New (20), Downloaded (18), In progress (27), Implemented (25), and Rejected (3). The main table lists recipients with columns for Country, Operator, TADIG Code, Implementation Status, Comment, Last Update, and Reminded. The 'Implementation Status' column is circled in blue. The table shows various countries and operators with their respective implementation statuses and comments.

Country	Operator	TADIG Code	Implementation Status	Comment	Last Update	Reminded
Afghanistan	Afghan Telecom	AFGAT	New			2025-09-22
Afghanistan	Afghan Wireless Com...	AFGAW	In progress	Issue with IMSI translation	2025-09-22	
Afghanistan	Etisalat Afghanistan	AFGEA	Implemented		2025-09-22	
Afghanistan	MTN Afghanistan	AFGAR	Downloaded		2025-09-22	
Afghanistan	Telecom Development Com...	AFGTD	New			2025-09-22
Albania	One Albania sh.a	ALBAM,ALREM	Implemented		2025-09-22	
Albania	Plus Communication sh.a	ALBM4	New			2025-09-22
Algeria	Vodafone Albania	ALBVF	Rejected	No roaming relation in place	2025-09-19	
Algeria	ATM Mobilis	DZAA1	Downloaded		2025-09-19	
Algeria	Djazzy	DZAO7	In progress		2025-09-19	
American Samoa	Coredoe Algérie	DZAWT	Implemented		2025-09-19	
American Samoa	American Samoa Telecom...	ASMAT	New			2025-09-22
Andorra	Bluesky Communications	ASMAS	In progress		2025-09-19	
Angola	Andorra Telecom	ANDMA	In progress		2025-09-19	
Angola	Movicel - Telecomunicações	AGOMV	Downloaded		2025-09-19	
Anguilla	Digicel Anguilla	JAMAG	Downloaded		2025-09-19	

2) Update All IR.21 Reports and Add 13 New Reports

- **Update existing IR.21 reports**
 - Add sender TADIG code to all existing reports
 - Add IPX VLAN information to “Connection to inter-PMN IP backbone” report
- **Add 13 new reports** with customisable views and export functionality (**Overleaf**)



Add 13 New Reports (Contd.)

**IR.21 version:
List the IR.21
version per
operator**

**Mobile global
title information**

**Short number
translation**

**2G/3G QoS
profiles**

**Connection to
inter-PMN IPv6
backbone**

**Authoritative
DNS servers**

**Local caching
DNS servers**

**GRX/IPX
providers**

LTE QoS profiles

**VoIMS roaming
services**

**SEPP
information**

5G QoS profiles

SMS capabilities

Add 13 New Reports (Contd.)

2G/3G QoS profiles (Section 16 (Packet Data Services))

- Section 16 (Packet Data Services)
 - 2G/3G QoS profiles
 - Profile name
 - Traffic class type (List)
 - ARP (List)
 - Evolved ARP (Boolean)
 - Evolved ARP priority level (List)
 - Evolved ARP preemption vulnerability (Boolean)
 - Evolved ARP preemption capability (Boolean)
 - Maximum bit rate uplink (Kbps)
 - Maximum bit rate downlink (Kbps)
 - Delivery order (Boolean)
 - Maximum SDU size
 - SDU format information (List)
 - SDU error ratio (Enumeration)
 - Residual bit error rate (Enumeration)
 - Delivery of erroneous SDU (Boolean)
 - Guaranteed bit rate uplink (Kbps)
 - Guaranteed bit rate downlink (Kbps)
 - Traffic handling priority (List)
 - Speech source support (Boolean)
 - Signalling indication support (Boolean)

LTE QoS profiles (Section 20 (LTE Roaming))

- Section 20 (LTE Roaming)
 - LTE QoS profiles
 - Profile name
 - QCI value (List)
 - QoS ARP (List)
 - Evolved ARP preemption vulnerability (Boolean)
 - Evolved ARP preemption capability (Boolean)
 - Maximum bit rate uplink (Kbps)
 - Maximum bit rate downlink (Kbps)
 - Guaranteed bit rate uplink (Kbps)
 - Guaranteed bit rate downlink (Kbps)

Add 13 New Reports (Contd.)

SEPP information (Section 28 (5G SA Roaming))

5G QoS profiles (Section 28 (5G SA Roaming))

- Section 28 (5G SA Roaming)
 - SEPP information
 - SEPP model (Enumeration)
 - MCC/MNC (List)
 - Well-known FQDN
 - SEPP FQDN
 - IPX provider name
 - IPX provider ASN
 - TLS protocol (Boolean)
 - PRINS protocol (Boolean)

- Section 28 (5G SA Roaming)
 - 5G QoS profiles
 - Profile name
 - 5QI (List)
 - ARP priority level (List)
 - ARP preemption vulnerability (Boolean)
 - ARP preemption capability (Boolean)
 - Maximum bit rate uplink (Kbps)
 - Maximum bit rate downlink (Kbps)
 - Guaranteed bit rate uplink (Kbps)
 - Guaranteed bit rate downlink (Kbps)

Add 13 New Reports (Contd.)

Do Note:

- Reports shall show data from the latest IR.21 document of all organisations that have been distributed to all roaming partners
- Reports shall only show data from sections that have not been hidden by operators
- It shall be possible to export all reports as CSV and Excel
- Current architecture needs to be adapted to support the expanded reports section.

Change Due to New Operational Data Requirements

Update Fraud section layout

The Operational Data Fraud section shall be updated:

- Show NRTRDE above High Usage Reports
- Group existing HUR elements in a new “High Usage Reports” subsection with Enable /Disabled buttons (Disabled by default)
 - Sending HUR emails
 - Fallback fax method for sending HUR
 - Receiving HUR emails
 - Fallback fax method for receiving HUR
- Add a red warning text if enabled: “Please ensure your agreements permit the use of HUR, as current templates do not recognise HURs.”

The screenshot displays the configuration interface for NRTRDE. The top section, titled "NRTRDE", includes a search bar for TADIG codes (currently showing "LUXRS"), and two input fields for "Supported version for sending*" and "Supported version for receiving*", both set to "2.1". The bottom section, titled "High usage reports", is highlighted with a red border. It features an "Enable" button (highlighted in green) and a "Disable" button. A red warning message is displayed: "Please ensure your agreements permit the use of HUR, as current templates do not recognise HURs." Below this, there are four input fields for "Sending HUR email", "Fallback Fax method for sending HUR", "Receiving HUR email", and "Fallback Fax method for receiving HUR".

RAEX IR.21 User Inputs needed!

- **RAEX users not updating to the latest version risk...**
 - Missing out on optimising interworking/roaming revenue
 - Efficiency benefits
 - Improved customer experience
- **Please update your IR.21 version to Rel 18 and your RAEX version from end of March 2026! 😊**





Fabrizio Fiorucci

Roaming Engineer
TIM

Advancing Interoperability in roaming

Agenda

1. IR.21: The International Roaming Industry Specification Number 21
2. Brief history on releases through years
3. RAEX IR.21
4. Rationales of the v18 release
5. Expected features
6. Areas where improvements apply
7. Schema of the approved changes
8. New technology requirements
9. Show me the data: reporting features
10. Ecosystem of numbers: operator's perspective
11. Steps forward

GSMA
Official Document IR.21 GSM Association Roaming Database, Structure and Updating

GSMA™

GSM Association Roaming Database, Structure and Updating
Version 18.1
19 January 2026

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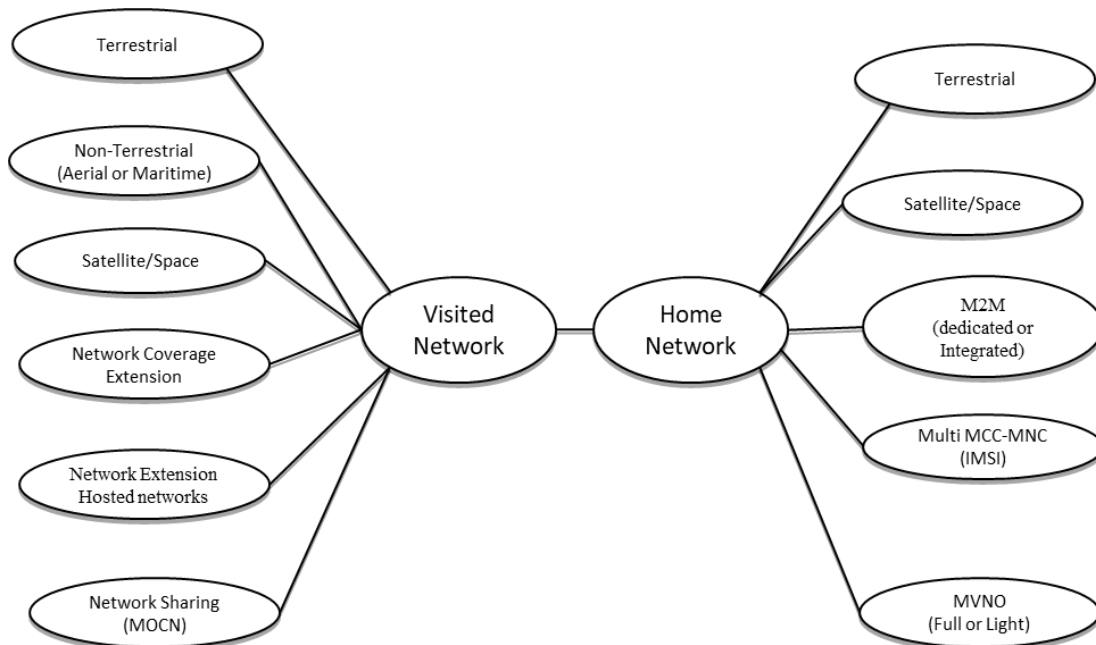
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OR

This Reference Document has been developed and is maintained by GSMA in accordance with the provisions set out in GSMA AA-34 - Policy and Procedures for Official Documents.

1- IR.21: International Roaming

Permanent Reference Document Number 21



Born as a centralized roaming database for international operators

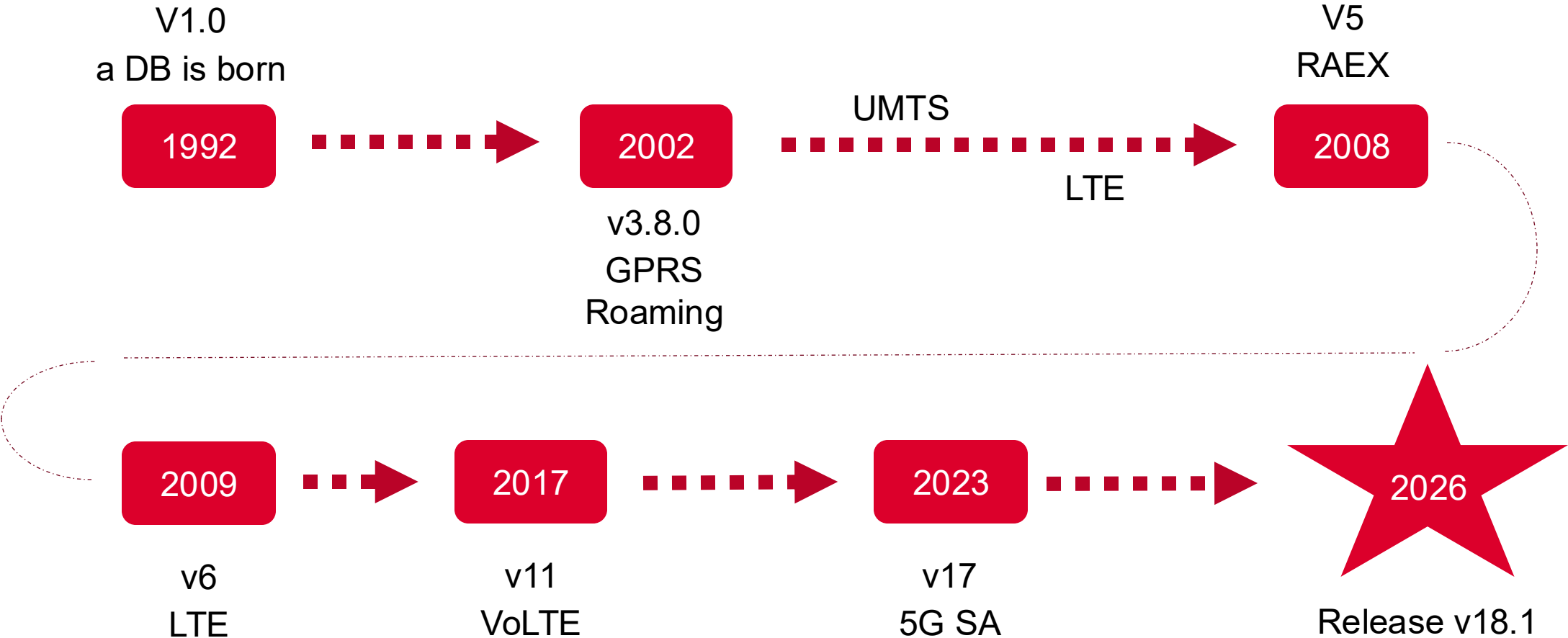
A standard mechanism through which operators share roaming data

Essential for 2G/3G/4G/5G roaming interoperability

Binding reference for all GSMA members to setup and maintain relations

28 structured sections are covering all network types of information

2 – Brief history on releases through years



3 – RAEX IR.21

RAEX stand for Roaming Agreement Electronic eXchange

A standardized format and method to notify and distribute information

Guarantees security and reliability and is available to all GSMA members

Security of the exchanged data means a better service for final customers

Reliable data means less errors in data definition and therefore less impact and issues in the service and networks

A more efficient troubleshooting is one of the key benefits

API methods available to operators to easy build up and maintain internal database

4 - Rationales of the v18 Release

Work coordinated by NRG Chair and supported by the community

Demand from the industry to support the technology evolution in Roaming

Review of the structure and the consistency

Adding new sections of data

Emergency
Services

Inbound
Roaming
Protection

Mission
Critical

Improvements through the PRD so through the RAEX database

Extrapolation of use cases in a new PRD (NG.155)

24 CR implemented for v18 and a last CR for v18.1

5 – Expected features

New rules and functionalities within the tool

Industry requirements (MCX, Emergency Services, Roaming Protection)

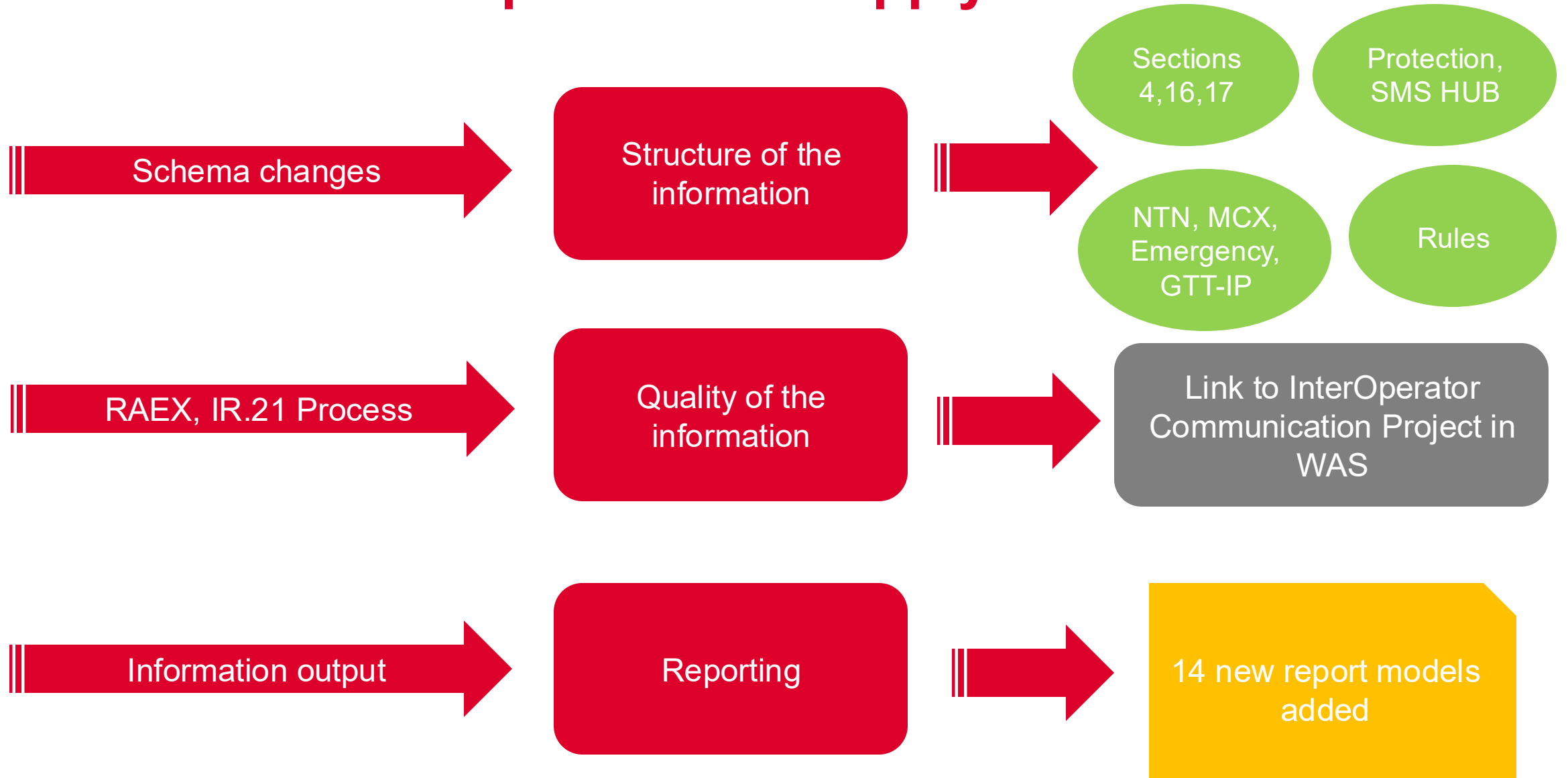
Alignment with the current telecommunications landscape and new technologies

Improvement of numbering definitions with the new market players

Definition of rules for data consistency

Harmonization of the 2G3G Sunset information

6 - Areas where improvements apply



7 - Schema of the approved changes

CR No	Description	Note
CR1105	Inbound Roaming Protection	Structure
CR1110	MSISDN Lenght	Structure
CR1111	GTT-IP	Structure
CR1112	GAP Analysis	Structure
CR1113	Emergency Call Report	Reporting
CR1114	Confidentiality clarifications	Quality
CR1115	Additional Emergency call data	Structure
CR1116	Emergency Section *NEW*	Structure
CR1117	RAEX Tool improvements	Quality
CR1118	Removal of «Public» and Annex C	Quality
CR1119	Annex D updates	Structure
CR1120	Editorial changes	Quality
CR1121	Emergency improvements	Structure

CR No	Description	Note
CR1122	Add of various reports	Reporting
CR1123	Section 4 split	Structure
CR1124	Section 17 improvements	Structure
CR1125	Section 16 improvements	Structure
CR1126	Release section improvements	Quality
CR1127	Contact section improvements	Structure
CR1128	MCX	Structure
CR1129	Improve IP address in Annex D	Structure
CR1130	SMS HUB	Structure
CR1131	Rules	Structure
CR1132	Confidentiality for emergency comm	Structure
CR1133	Editorial changes after R18 approval	Structure

8 - New technology requirements

Emergency
Services

Annex A - 30

Mission Critical

Section 2

SMS HUB

Section 12

Inbound Roaming
Protection

Annex A - 31

GTT-IP
in VoIMS Section

Annex A - 26

9 – Show me the data: reporting features

Public reports are defined in Annex H and are available into Members Gateway RAEX Tool

R18 comes with a big increase of reports

Really useful for not only MNOs but for any member of the industry



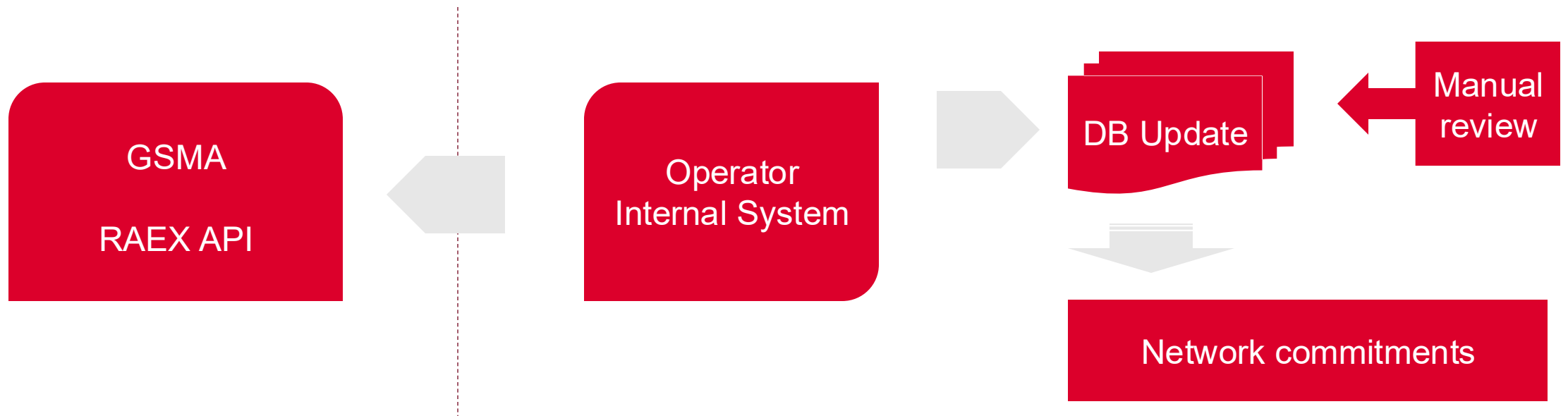
To support emergency calls for inbound roamers (RAEX Section 26)

10 - Ecosystem of numbers: an operator's perspective

Up to **800** operators are RAEX compliant today

RAEX IR.21 notification system is running on up to **8** new updates per day

This results in a commitment that targets up to **1k** changes per month in the network elements



11 - Steps forward

100% RAEX IR.21 compliant: a possible dream?

Create an IR.21 Admin List for the day-by-day cooperation

Integrate new functionalities, enhance API structure and available methods

Technology evolutions



All GSMA community members are invited to take part of this evolution and to the success of this ongoing project through working groups Network Group (NG) / Network Roaming Group (NRG)

Thank You!

Q&A

Thank you