Session 4: Major topics on Numbering & Networks
Working Group Numbering and Networks

The ECC’s Working Group Numbering and Networks (WG NaN) is responsible for developing policies in numbering, naming and addressing and advising on technical regulatory matters to promote and support telecom innovation and competition.

Focused on policy harmonisation rather than technical harmonisation.
## NUMBERING: Management of Numbering & Identifiers

### Traditional Telecoms World

- **Resources assigned to Administrations by ITU-T**
  - E.164 CC
  - E.212 MCC

- **Resources assigned by Administrations to service providers at the National level**
  - Telephone numbers (E.164)
  - MNC (E.212)
  - ISPC/NSPC (Q.708)

### Internet World

- **INR assigned direct to operators by ITU-T**
  - UIFN (E.169.1)
  - UIPRN (E.169.2)
  - IC (E.164.3)
  - ISCN (E.169.3)
  - Shared MNC (E.212)
  - Trials (E.164.2)

- **Other resources assigned by ITU-T**
  - ICC (M.1400)
  - Terminal (T.35)
  - Bureaufax (F.170)

### Legacy Resources

- **Non-ITU resources assigned by other entities**
  - IMEI (3GPP TS 23.003)
  - Domain name (RFC 1034)
  - IPv4-address (RFC 791)
  - IPv6-address (RFC 2460)
  - MAC (ISO 8802.3)
Technical harmonisation v Policy harmonisation

• Technical
  – Same number, same service (112, 116, 118 etc.)
  – Common tariff principles (freephone, shared cost etc.)

• Policy
  – Common assignment criteria and conditions of use
  – Common principles for number portability

• Definitions of an Electronic Communications Service (ECS)
  – Number-based and number-independent ECS (EECC)
  – Regulating OTTs and M2M
• **Competition**
  • Economic objectives require technical solutions
  • Ensuring non-discriminatory access to active and passive network infrastructure
  • Ensuring access to wholesale products

• **Consumer Protection**
  • Ensuring access to emergency services and the provision of caller location information
  • Provision of comparable information on QoS for internet access
Numbering and Network Topics

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1. eCall callback
2. Fraud & Misuse where E.164 numbers play a role
3. Handset-derived location information for emergency calls
eCall Callback
eCall is a European initiative intended to bring rapid assistance to motorists involved in a collision anywhere in the European Union.
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<th>Objective</th>
<th>Legislation title</th>
<th>Implementation deadline</th>
<th>Key requirements</th>
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| Member States  | Enable the reception of eCalls by the Public Safety Answering Points (PSAPs) | DECISION No 585/2014/EU of the European Parliament and of the Council on the deployment of the Interoperable EU-wide eCall service (OJ L 164, 3.6.2014 p.6-9) – [LINK](#)                                                                                                                                 | 1st October 2017         | • Free of charge to end users  
• Emphasis on personal data protection  
• Fully deployed across each nation (subject to network coverage)  
• Emphasis on public awareness |
• Automatic and manual triggering  
• Compatible with Galileo and EGNOS positioning systems  
• Optional support for private (TPS) eCall |
| MNOs           | Enable the transmission of eCalls from the car to the PSAP                | COMMISSION RECOMMENDATION of 8 September 2011 on support for an EU-wide eCall service in electronic communication networks for the transmission of in-vehicle emergency calls based on 112 (‘eCalls’) (OJ L 303, 22.11.2011, p. 46–48) – [LINK](#)  
(The Recommendation states a deadline of 31st December 2014, but this was extended to 31st March 2016 in the Regulation referenced above.) | 31st March 2016          | • Recognise eCalls through the presence of the eCall discriminator (flag)  
• Route eCalls to the appropriate PSAP through routing tables supplied by the Member State |
• Promote discussion on numbering options for eCall
• Bring attention to the benefits and drawbacks of each solution without promoting or ruling out any particular approach
• Promote recycling of numbering resources when a vehicle reaches end of life
• Encourage the use of remote provisioning technology
• ECC Recommendation (17)04 published on Numbering for eCall published in 2017
What is eCall callback?

- When an emergency call is dropped, standard operating procedure is to initiate a callback
- For eCall, it is also possible to request updated location information through a callback to the IVS
- Callback requires a valid CLI to be presented to the call taker.
- That number must be provisioned on all networks, including fixed networks
- eCall came into force on 31 March 2018 but uptake is still low as the requirement only related to ”new type” vehicles
- Early evidence suggests issues with callback where international numbering resources are used
Problems & Solutions

Problems

• Use of +882 and +883 15 digit ITU numbering resources
  – Numbers not configured on fixed networks
• Misconfiguration on PSAP PBX systems
  – Incorrect CLI displayed to PSAP call taker
• Call costs (numbers rated at €5 per min in some countries)

Solutions

• Raise awareness with operator community to open numbers
• Survey PSAPs to determine problem countries
• Present evidence to EU-led European eCall Implementation Platform
Fraud & Misuse where E.164 numbers play a role

The Role of E.164 Numbers in International Fraud & Misuse of Electronic Communications Services
The use of networks and services to perpetrate fraud is an increasingly difficult challenge for regulators and industry players to overcome.

Intelligence at the edge and regulatory jurisdiction are fraud enablers.


Shift in focus needed to recognise consumer impact as well as revenue impact of fraud.

CLI Spoofing facilitates fraud “during the call”.
Fraud Method – is how they access the network or service to enable revenue gain from the attack

**Top Fraud Methods 2017**
- $2.03 B – Subscription Fraud (Identity)
- $1.94 B – PBX Hacking
- $1.94 B – IP PBX Hacking
- $1.93 B – Subscription Fraud (Application)
- $1.75 B – Subscription Fraud (Credit Muling/Proxy)
- $1.66 B – Abuse of Service Terms & Conditions
- $1.66 B – Account Take Over

Fraud Type – is how they use the service or network to generate revenue from the attack

**Top Fraud Types***:
- $6.10 B – International Revenue Share Fraud (IRSF)
- $4.27 B – Interconnect Bypass (e.g. SIM Box)
- $3.26 B – Arbitrage
- $3.02 B – Theft / Stolen Goods
- $2.39 B – Premium Rate Service
- $2.10 B – Device / Hardware Reselling
Arbitrage – Intra-EU termination rates

- Low termination rates between EU members
- Traffic originating outside EU can be charged at higher ITR
- Different rates for different origin zones/countries
- A-Number (CLI) used to determine ITR

20 - 25% CLI spoofing infection rate (source: BICS)
ECC Work on Fraud

- ECC Report 275 - Tackling the issues requires a coordinated multi-stakeholder response
- Platform for dialogue and information sharing needed
- Public workshop on 11 December 2018 attracting 90+ stakeholders
- Further work:
  - CLI Spoofing (including implementation of SHAKEN in Europe)
  - Withholding payments at the wholesale level in cases of suspected fraud
Handset-derived location information for emergency calls
Handset-derived location information for emergency calls

- Over 70% of emergency calls originate on mobile networks (source: EENA)
- The provision of emergency caller location information is a requirement of the Universal Services Directive (and the EECC) in Europe.
- In reality, only Cell-ID is provided in most countries
- Smartphone penetration in Europe now at 68% and climbing (Statista 2019)
- Leverage the handset! (other industries are doing so)

- **ECC Report 225**
  ‘For mobile networks, A-GNSS-based positioning stands out of the list of available positioning methods in terms of accuracy, reliability and cost and should be implemented as a positioning method for emergency calls’
Advanced Mobile Location

1. Call to emergency services (Cell-ID sent)

2. Phone calculates location

3. Location sent (SMS, HTTPS)

4. Push/Pull to PSAP

Legislative changes – EECC

‘……shall include network-based location information and, where available, handset-derived caller location information’
Progress to date and next steps

• Now available in 98.5% of all smartphones on the market globally
• EENA promoting its adoption across Europe
• Already implemented in Austria, Belgium, Estonia, Finland, Iceland, Ireland, Lithuania, Moldova, the Netherlands, New Zealand, Norway, Slovenia, United Kingdom
• Work continues on standardisation (ETSI SC EMTEL) for AML 2.0 including:
  • A clear description of transport methods using SMS “Data SMS” (using different Data Coding Scheme and Port) and HTTPS messages
  • An enlarged message scope to include other attributes (e.g., altitude, emergency number used)
  • Consideration of ways to manage handset roaming to other countries
ePrivacy in the EU

- ePrivacy Regulation
- Unlikely to come into effect before 2021

Article 8:

1. The use of processing and storage capabilities of terminal equipment and the collection of information from end-users' terminal equipment, including about its software and hardware, other than by the end-user concerned shall be prohibited, except on the following grounds:

   (f) "It is necessary to locate terminal equipment when an end-user makes an emergency communication either to the single European emergency number ‘112’ or a national emergency number, in accordance with Article 13(3).

Article 13:

1. "Regardless of whether the calling end-user has prevented the presentation of the calling line identification, where emergency communications are made to emergency services, providers of number-based interpersonal communications services shall override the elimination of the presentation of the calling line identification and the denial or absence of consent of an end-user for the processing of metadata. [...]"

3. Notwithstanding Article 8(1), regardless of whether the end-user has prevented access to the terminal equipment's Global Navigation Satellite Systems (GNSS) capabilities or other types of terminal equipment based location data through the terminal equipment settings, when a call is made to emergency services, such settings may not prevent access to such location data to determine and provide the calling end-user's location to an organisation dealing with emergency communications, including public safety answering points, for the purpose of responding to such calls.
Contact:
Freddie McBride BBS MSc DipRegGov
freddie.mcbride@eco.cept.org
+45 33 89 63 22

European Communications Office:
www.cept.org/eco
Follow us on Twitter – @CEPT_ECC Τwitter