

Numbers for eCall Devices - options and challenges

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Numbering Plan Management

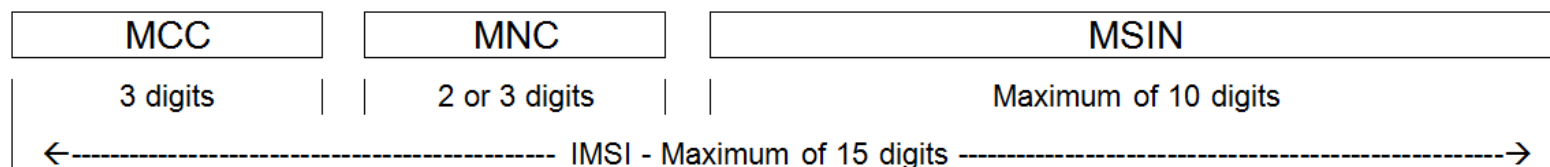
- Numbering a key enabler of communications services
 - **competition**: number portability and new numbers for new market entrants)
 - Numbering fosters service **innovation**
(numbers and short codes for new services – eCall, M2M, Harmonisation)
 - Numbering facilitates **consumer protection**
(Tariff transparency, CLI, Legal Intercept)
- Balance between providing numbers and mitigating risk of exhaustion. Number changes are expensive!
- Careful long term planning required - A strategic national resource
- Demand normally predictable and stable - except when new services emerge
- National Numbering resources assigned by numbering plan managers, typically NRA or Ministry
- International Numbering Resources assigned by ITU

Numbering for eCall – what we know

- eCall has all the characteristics of a mobile service
 - Solution based on circuit-switched technology using GSM/UMTS public networks
 - E.212 numbering resources needed for SIM card identification and mobile network authentication (even without mobility management)
 - Ability to roam between networks and across borders is essential
 - E.164 numbering resources needed to make and receive calls

International Mobile Subscriber Identity (IMSI)

- Telecommunication Standardization Sector of the International Telecommunications Union (ITU-T) is the primary international body for fostering cooperative standards for telecommunications equipment and systems.
- E.212. defines the international identification plan for public networks and subscriptions



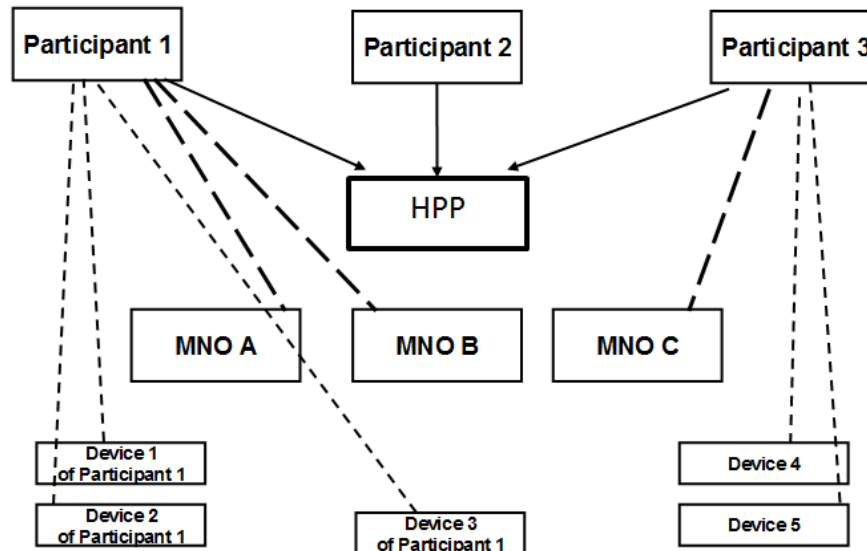
- 1,000 MCCs
- 100,000 MNCs overall
- 1,000,000,000,000,000 (10^{15} MSINs) A Quadrillion!
- Conclusion:
 - Lots of capacity overall
 - Each MNC assignee has 10 billion IMSIs to assign
 - But there is a bottleneck at the MNC level where there are only 100 resources
 - As demand increases, this may become a problem for NRAs.



IMSI –cont'd

- Operator lock-in
 - The switching challenge is very different for an individual consumer V an M2M end-user.
- Potential solutions to resolve lock-in
 - Administrative
 - Assign E.212 resources to large end users so IMSI range independent of underlying MNO (MVNO type approach)
 - Assign MNC from ITU under a shared MCC which is country-agnostic
 - Administrative solutions require action by ITU.
 - Technical
 - Use of SIM card that can be update remotely (OTA) – e.g. Embedded SIM (GSMA)
 - Welcome development. Solution would need to be standardised which may take some time
- For eCall, what are the options?
 - IMSI resource from country where vehicle is manufactured?
 - Different IMSI depending on the destination country?
 - International solution under shared MCC (e.g. 901) or shared national MNC for eCall?

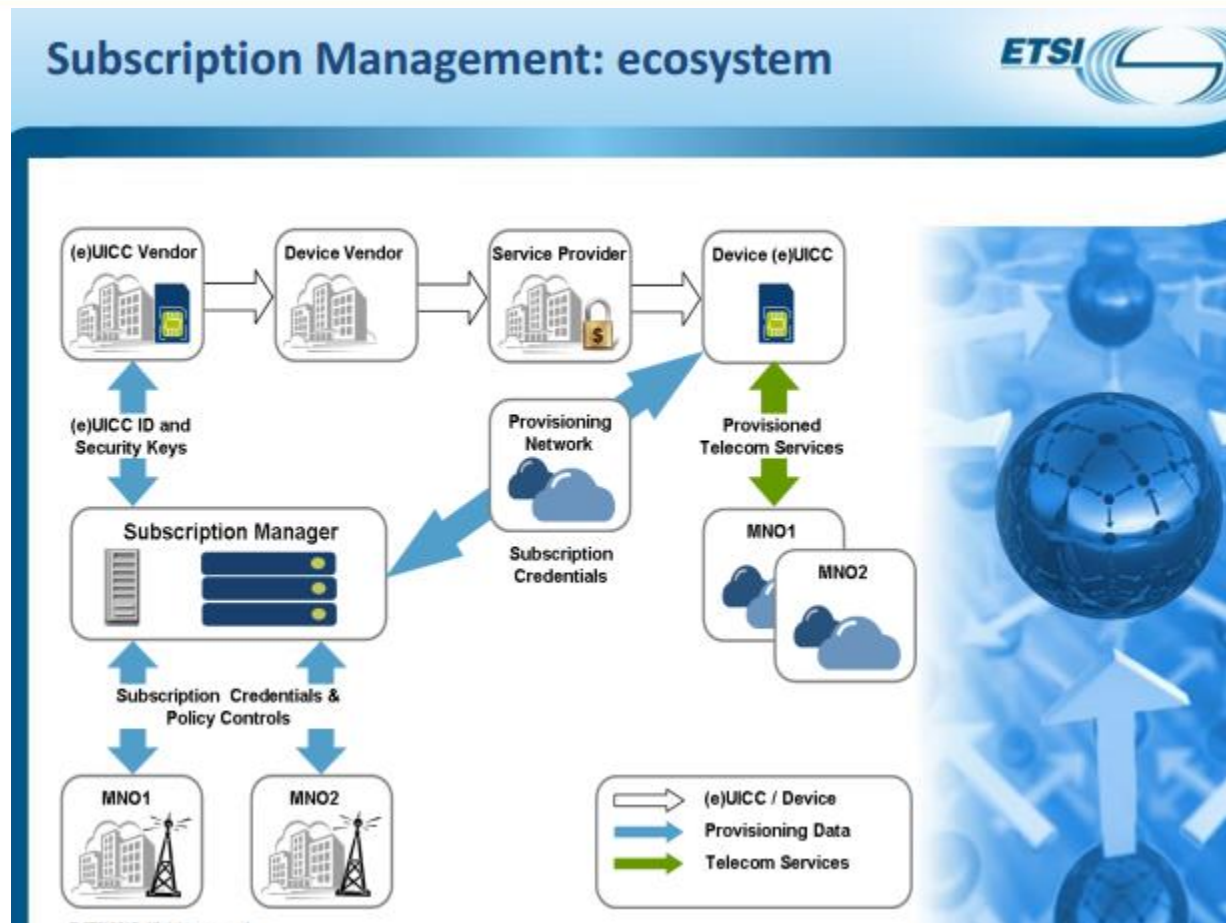
E.212 – Continued – MNC Sharing



- - - W/S contract for network use
- Owner or user of device
- > Governance + funding of Central Entity

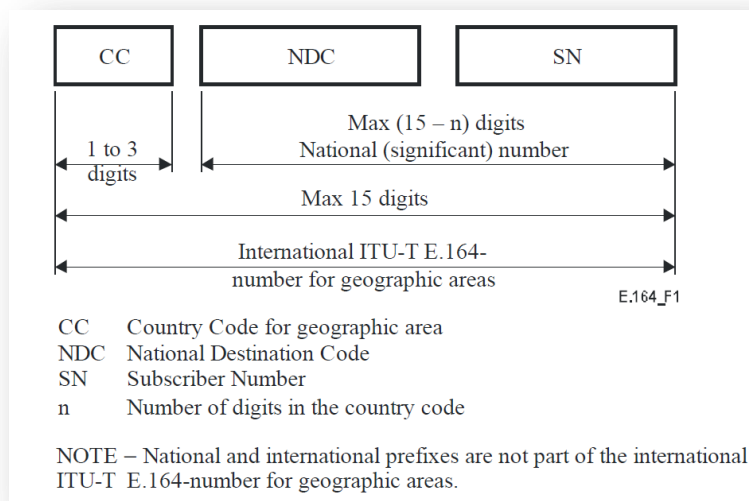
•Shared MNC Concept
 (source: Gedeeld gebruik MNC's voor M2M toepassingen,
 Rapport uitgebracht aan het Ministerie van Economische Zaken, Stratix, 2013)

E.212 – Continued – OTA Provisioning



ITU-T Recommendation E.164

- ITU-T Rec. E.164 defines the international public telecommunication numbering plan



- ITU assigns country code
- NRA/Ministry organises and develops numbering plan behind country code
- Number ranges designated for geographic/fixed, mobile, freephone, short codes etc.
 - Efficient management is essential - Addressing devices rather than personal subscriptions (households to individuals to machines) and cross border use.

E.164 Numbers for eCall

- Does an eCall device need an E.164 number?
 - Calling Line Identification (CLI) is required for allowing the PSAP to callback the eCall UE
 - Key question: Temporary or permanent assignment? (Russian Experience) (conflicting EC information)
- How many numbers required?
 - 230 million vehicles – 5% stock renewal each year (11.5 million)
 - New registrations in Europe (source: ACEA)

Year	2009	2010	2011	2012	2013	5 year average
New Registrations (000,000)	14	13	13	12	13,5	13

Source (ACEA)

- Demand for 13,000,000 new mobile telephone numbers per annum
- As an example, Ireland has a current total mobile numbering capacity of 70 million. Somewhere between 51% already allocated. (28% Free, 21% Reserved)
 - So eCall could use remaining capacity in Ireland within 2-3 years
 - Extending capacity means costly number changes

E.164 Numbers for eCall - continued

- Challenging to implement conservation measures
 - **Number recycling**
 - Numbers recycled after a period of quarantine (typically 1 year).
 - No significant recycling for at least 15 years (except for accident write-offs)
 - **Number Portability (NP)**
 - Consumers change service while retaining their number
 - Benefit of NP for eCall not obvious – E.164 number is used for addressing device rather than personal subscription – hidden numbers

- Options
 - **Using national numbers**
 - Mobile numbers (extra-territorial use could be an issue)
 - Relevant national number remotely provisioned when car registered in-country
 - Dedicated numbering ranges specifically for eCall and other M2M type applications
 - Number of digits in these ranges to be set at maximum as recognition not important
 - 7 digit number = 10 million capacity, 8 digit = 100 million, 9 digits = 1 Billion etc.
 - **Using international numbers**
 - Country-agnostic number range from ITU (+88x)

Conclusions and Next Steps

- Numbering resources can be made available for eCall. There is no capacity issue *per se*
- Collaboration between key stakeholders is necessary to ensure that the most appropriate solution is found
- From a numbering plan management perspective the numbering solution should provide sufficient capacity in the long term and be efficient and sustainable in order to avoid a "mish-mash" of different solutions.
- WG NaN welcomed EeIP announcement on establishment of Task Force "Lifecycle management"
- WG NaN considers that this would be the right forum for discussing the numbering issues

Thank you for your attention!



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