eCall
– A case study on the numbering requirements

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CEPT M2M Workshop
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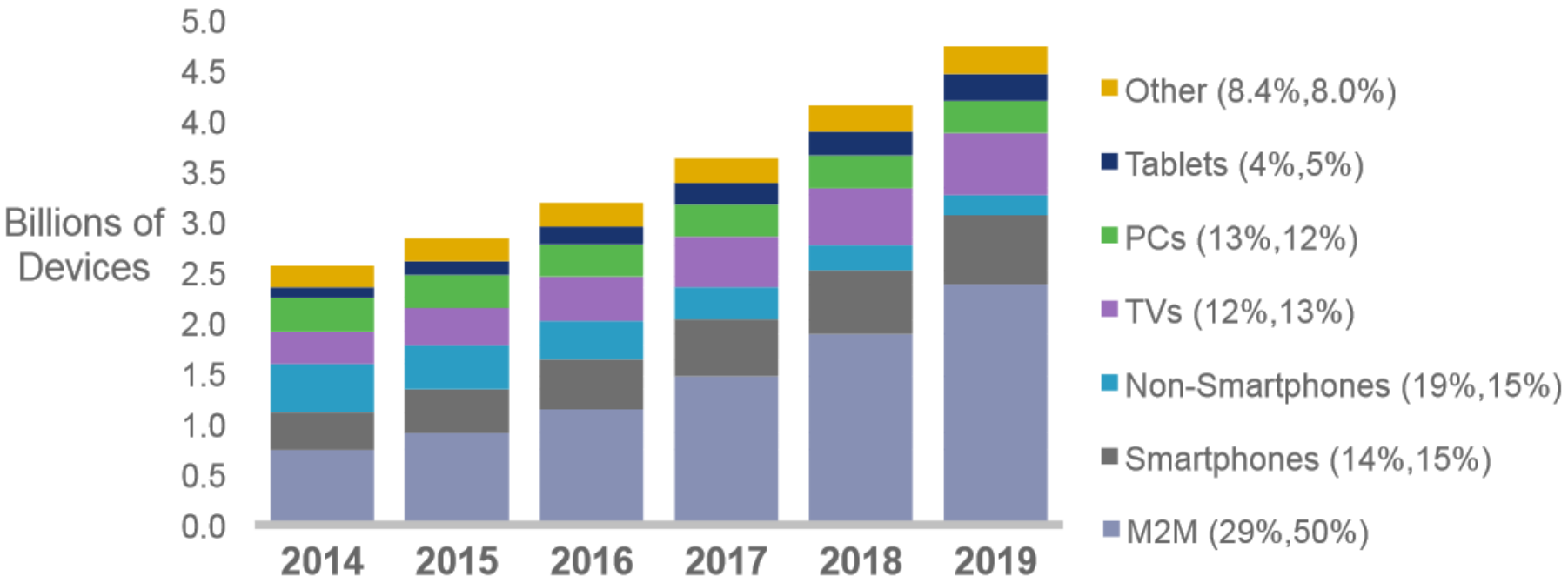
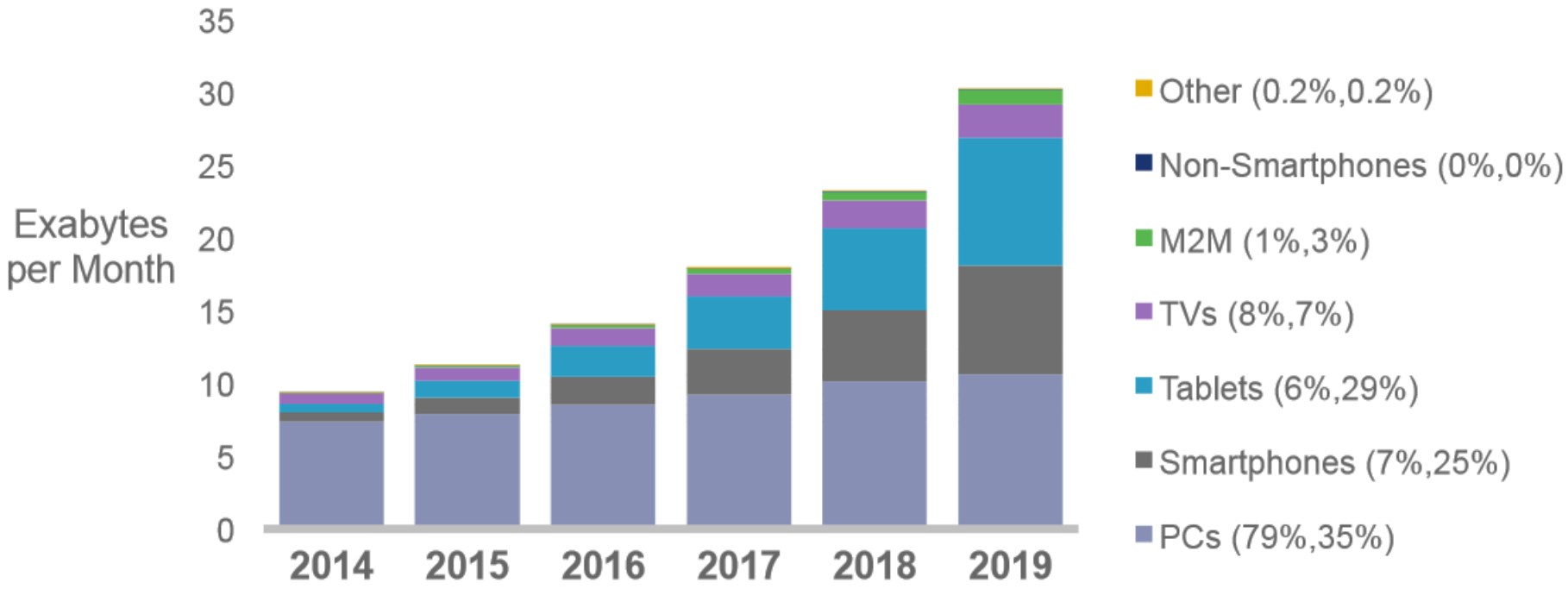
By 2019, 50% of Total Connections in Europe will be M2M



Source: CISCO

“BUT……M2M Traffic Only About 3% by 2019”



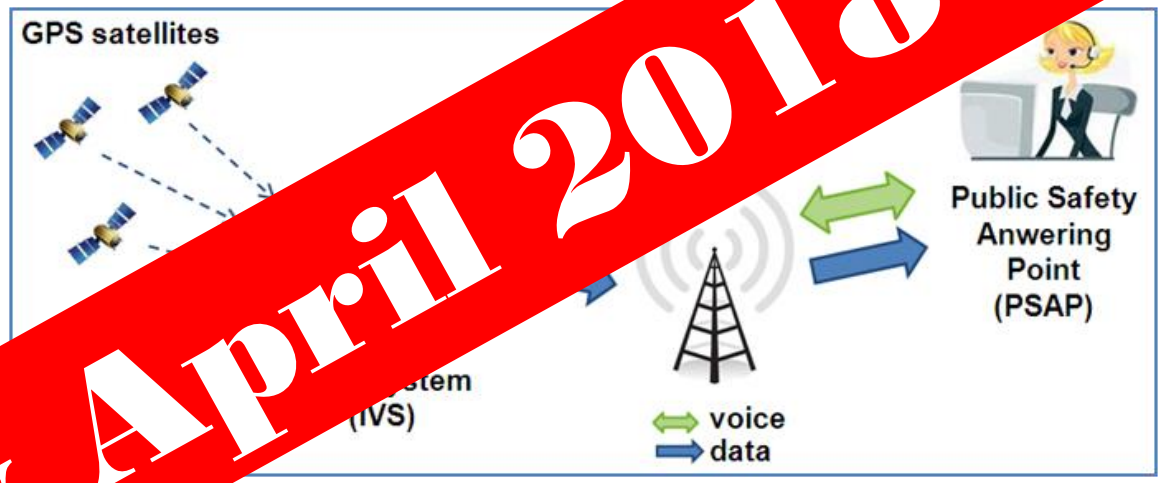
Source: CISCO

What does this mean for numbering?

- For spectrum management, the relationship between the number of connections and traffic volume is an extremely important consideration. i.e. capacity planning and network dimensioning, peak loads etc.
- For numbering plan management, the relationship is not so important.
- Once a number is assigned to a device it is “in use” regardless of whether it is connected or communicating.
- While not all M2M devices will require numbers, some applications are likely to require significant volumes of numbers…….like eCall.

eCall – brief introduction

eCall is a European initiative intended to bring rapid assistance to motorists involved in a collision anywhere in the European Union.



Source: Wireless Design & Development

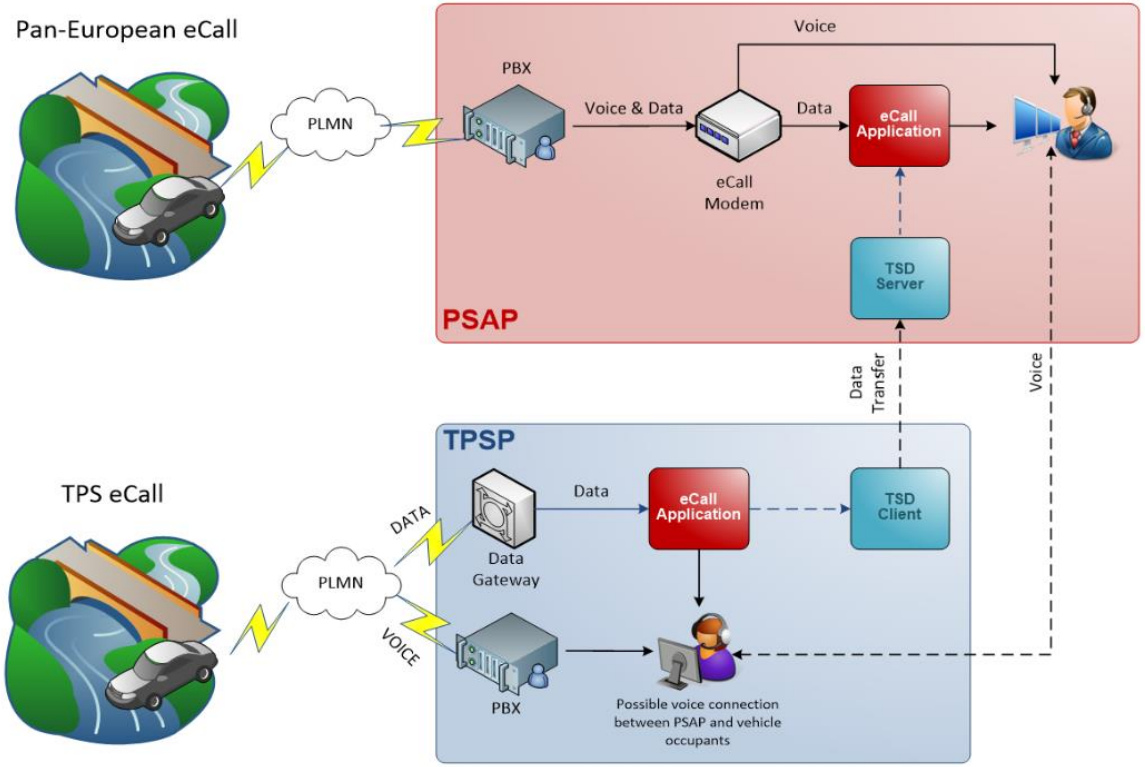
By April 2018

eCall is not optional in the EU-28. It is mandated through amendments to the type approvals directive with a confirmed implementation date.

eCall numbering requirements

- Why do we need numbers in the first place?
  - eCall is essentially a mobile service
  - eCall needs wide geographic coverage and the ability to roam between networks
  - Emergency calls from “simless” devices not supported in a lot of European Countries
- For network authentication and registration (including roaming) each eCall in-vehicle system needs an International Mobile Subscriber Identity Number (IMSI)
- Each eCall in-vehicle system needs an telephone number (or MS-ISDN or E.164 number) to be able to make a call and present a valid CLI.
- A valid CLI is needed to facilitate callback

eCall only V. TPS eCall + VAS



Source: EENA

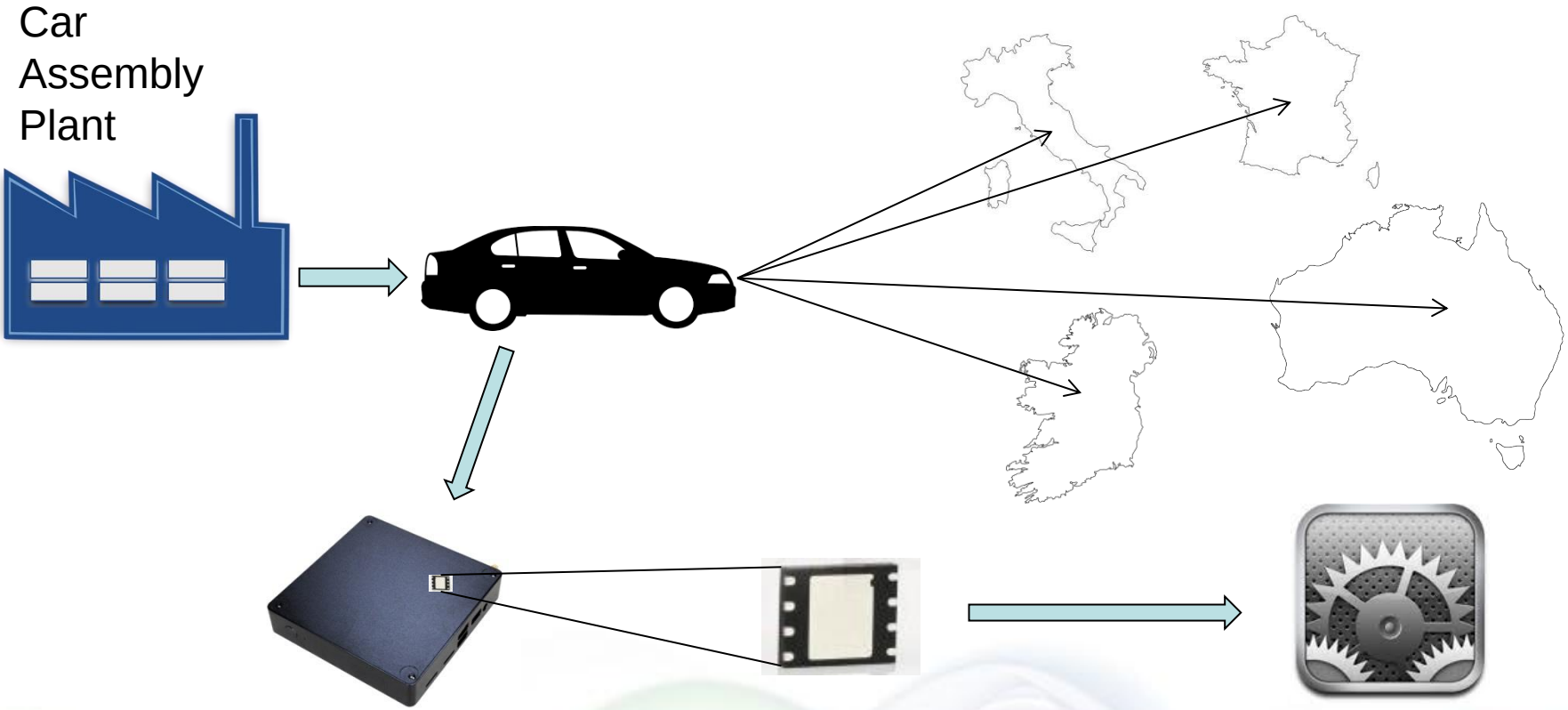
There is no business opportunity in eCall alone.

112 eCall and TPS eCall services *"can coexist provided that the measures necessary to ensure continuity in the provision of the service to the consumer are adopted. "*

"all vehicles should be equipped with the public 112-based eCall service, regardless of whether or not a vehicle owner opts for a TPS eCall service."

- REGULATION (EU) 2015/758

What deployment will look like



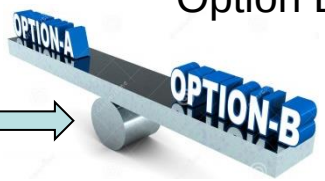
In-vehicle system

embedded SIM
(eUICC-ID)

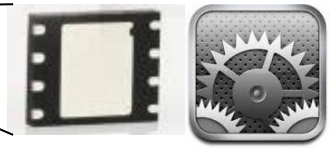
Generic Provisioning Profile
With IMSI number

What deployment will look like – cont'd

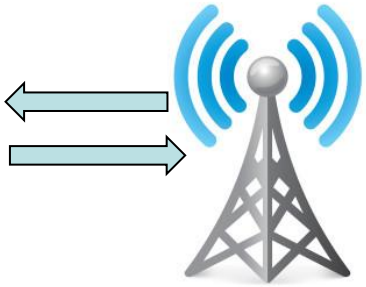
Option A – eCall Only
Option B – eCall+VAS



In-vehicle system



embedded SIM
with generic
provisioning profile



Local profile with new IMSI and telephone number download from the network.

Profile characteristics

- eCall-only profile
  - Dormant – no mobility management
  - Privacy by design
  - No subscription

- eCall+VAS profile
  - Always connected
  - Subscription-based service
  - Privacy right waived in subscription agreement

Only one profile can be active at any given time!!

Telephone Numbers for eCall

- How many numbers required?
  - 270 million vehicles – 5% stock renewal each year (13.5 million)
  - New passenger car registrations in Europe (source: ACEA)

Year	2010	2011	2012	2013	2014	5 yr average
New registrations (000,000)	**13,37**	**13,15**	**12,05**	**11,87**	**12,54**	**13,2**

- Demand for approximately 13,000,000 new mobile telephone numbers per annum
- Options
  - National numbers (assigned by National authorities)
    - Dedicated M2M numbers
    - Mobile numbers
- International numbering resources (Assigned by ITU-T)
  - +882, +883 number ranges

IMSI Numbers for eCall

- ITU-T Recommendation E.212. defines the international identification plan for public networks and su

MCC	MNC	MSIN
3 digits	2 or 3 digits	Maximum of 10 digits

← IMSI - Maximum of 15 digits →

- 1,000 MCCs
- 100,000 MNCs overall
- 1,000,000,000,000,000 (10^{15} MSINs) A Quadrillion!
- Options
  - Geographic MCC+MNC (assigned by National authorities)
  - Country-agnostic (MCC+MNC from 90x range assigned by ITU-T)

Other issues

- **Risk of exhaustion**
  - Biggest risk is that the burden of addressing eCall devices falls disproportionately on larger European countries.
  - Local profile download reduces this risk
  - National authorities should be engaged with MNOs and automotive industry to the lessen the risk of exhaustion.
- **Number recycling**
  - Numbers recycled after a period of quarantine (typically 1 year).
  - No significant recycling opportunity for at least 15 years (except for accident write-offs)
- **Number Portability (NP)**
  - Relevance of NP for eCall (or M2M in general) not obvious – E.164 number is used for addressing device rather than personal subscription – hidden numbers
  - The car manufacturer is the end user (In terms of the regulatory framework) so has a right to switch if granted rights of use.

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
- WG NaN actively participating in EeIP Task Force "Lifecycle management" in order to raise awareness of the numbering challenges related to the SIM during the vehicle life time
- LCM Report due to be published in June 2016
- WG NaN may follow up with guidelines in the form of an ECC Recommendation

Thank you for your attention!

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