NG112 and the new Emergency Services Networks landscape

Challenges and opportunities

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The European Emergency Number Association

Executive Summary

- NG112 and next generation emergency networks
- Challenges and opportunities

> The evolution of telco technologies has significantly changed the way people communicate
> Multimedia capabilities are available everywhere
> This evolution has reached also the emergency networks ecosystem in different areas
> How this new landscape will impact NG112 from different (technical, economical, legal/regulatory) points of view will be analyzed

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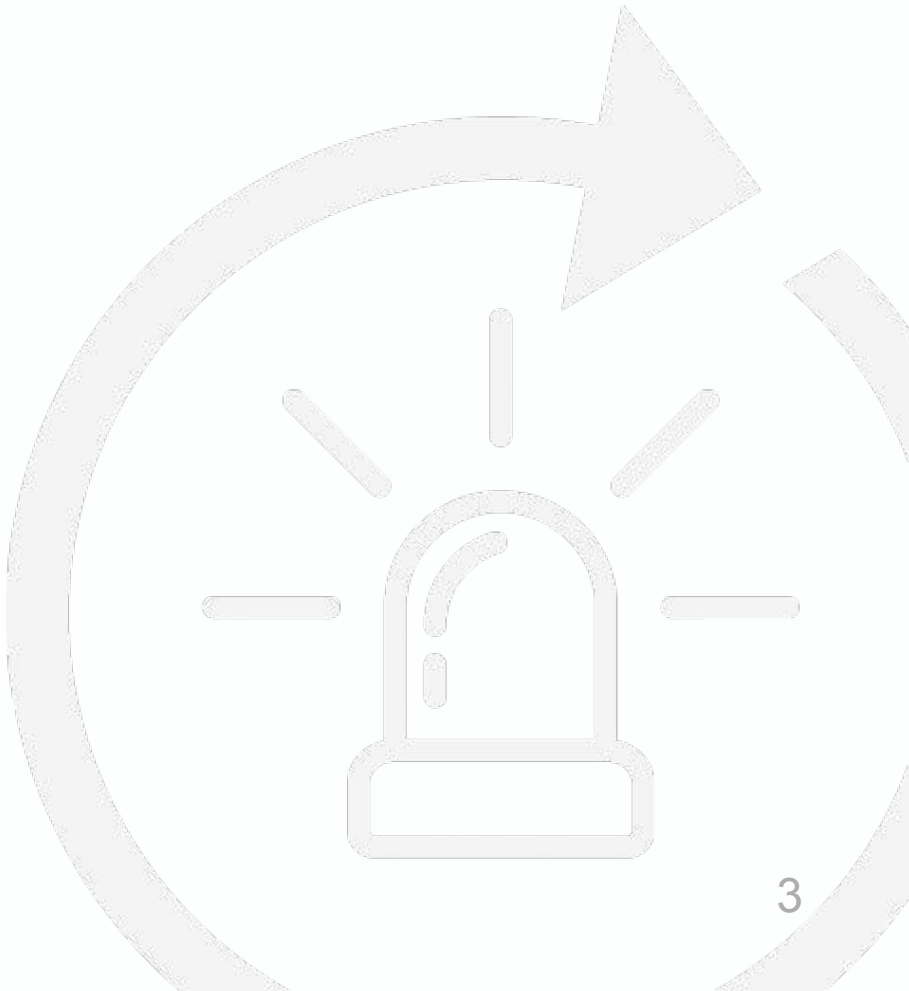
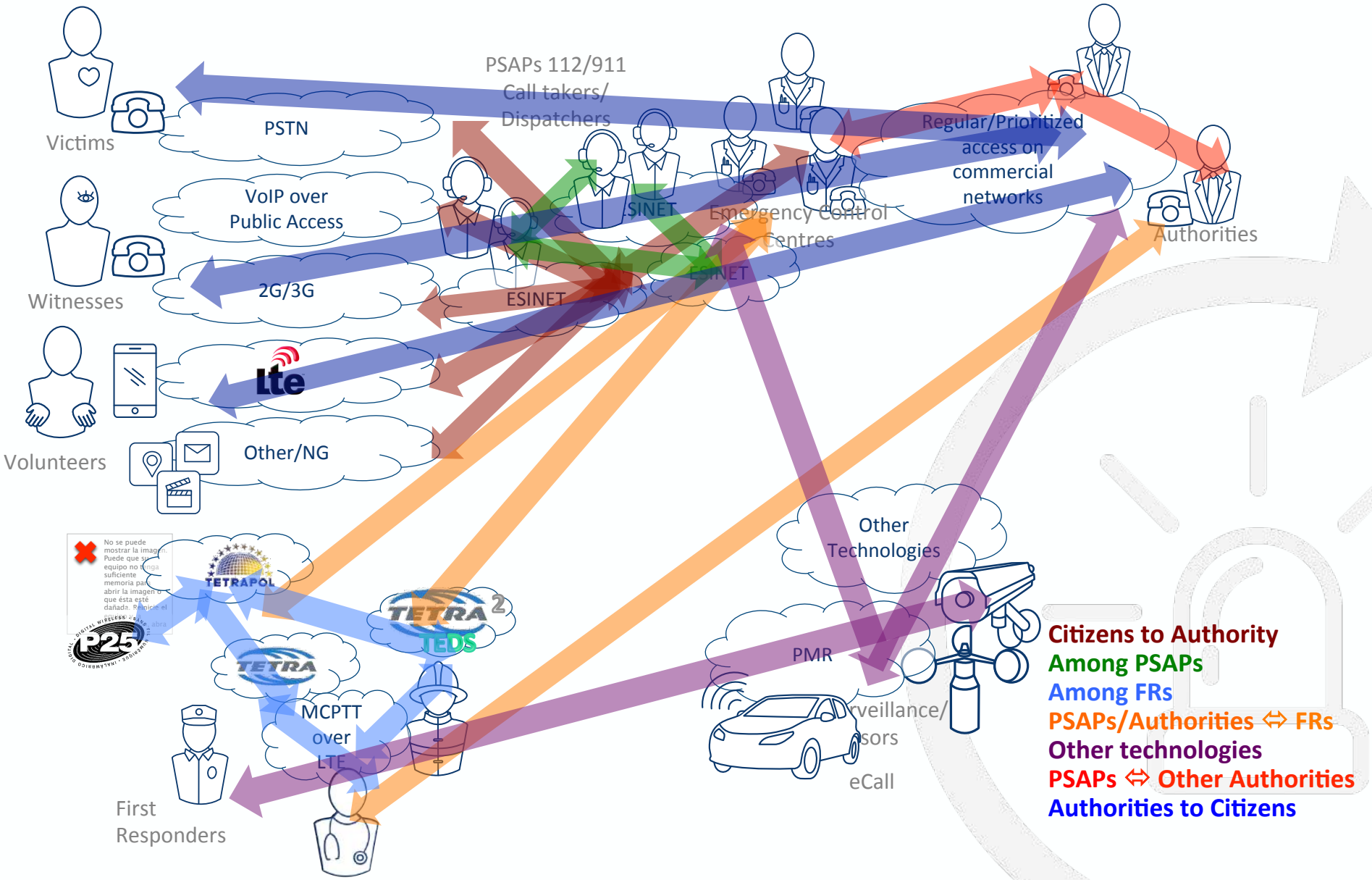


CHAPTER

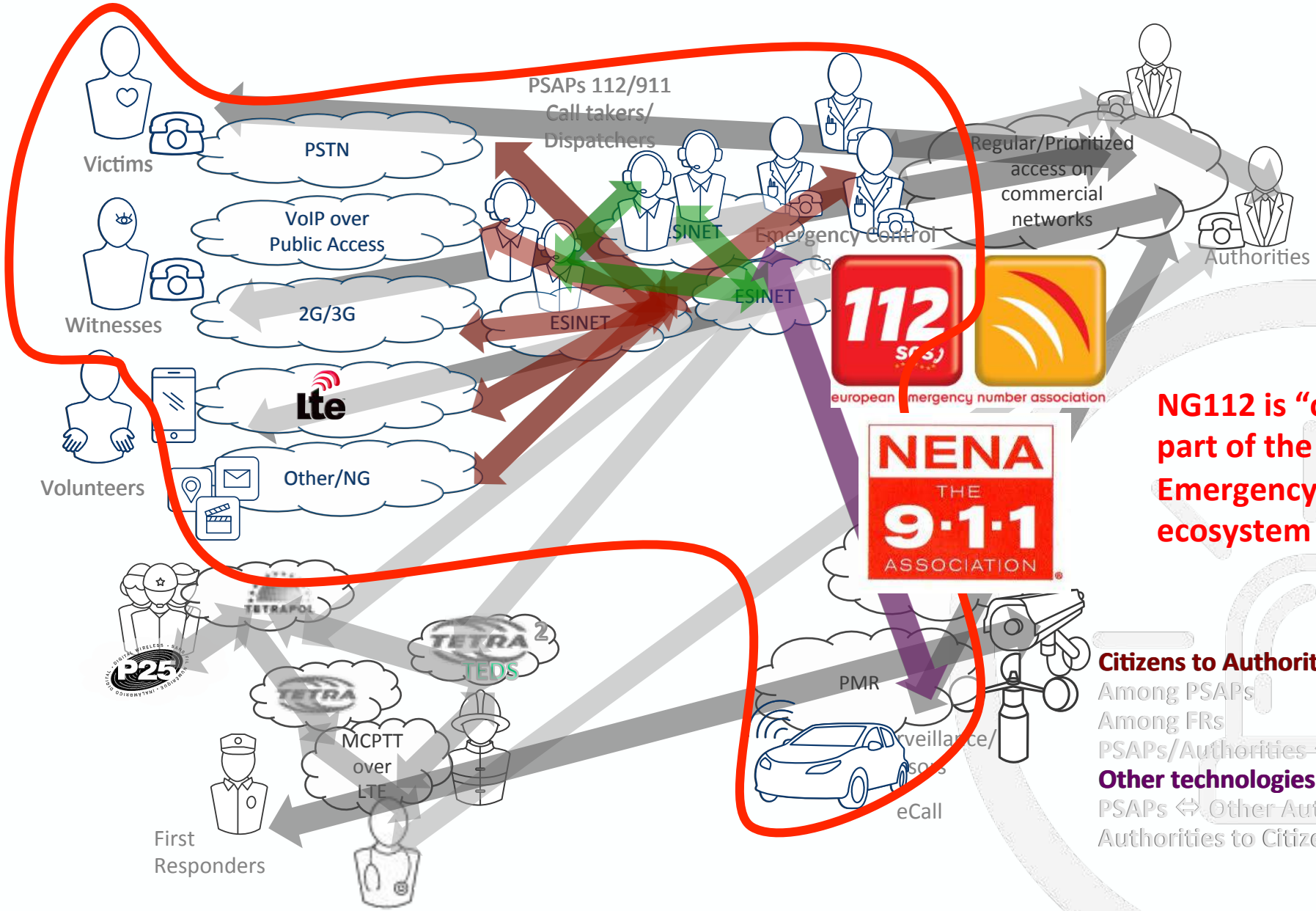
1

Introduction: The next generation emergency networks landscape

Next Generation Emergency Networks landscape



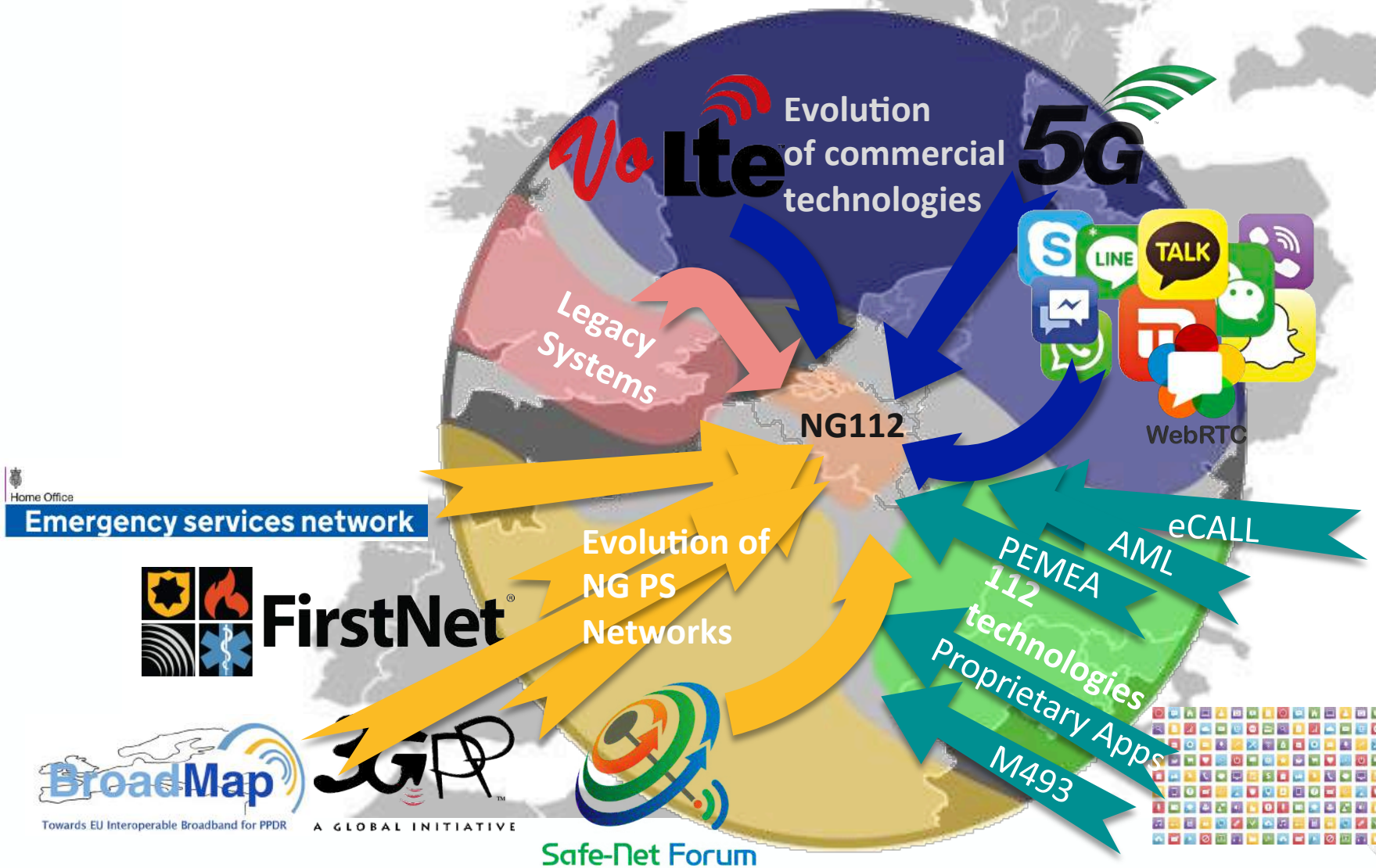
Next Generation Emergency Networks landscape



NG112 is "only" a specific part of the NG Emergency Networks ecosystem

Citizens to Authority
Among PSAPs
Among FRs
PSAPs/Authorities ⇔ FRs
Other technologies
PSAPs ⇔ Other Authorities
Authorities to Citizens

Next Generation Emergency Networks landscape

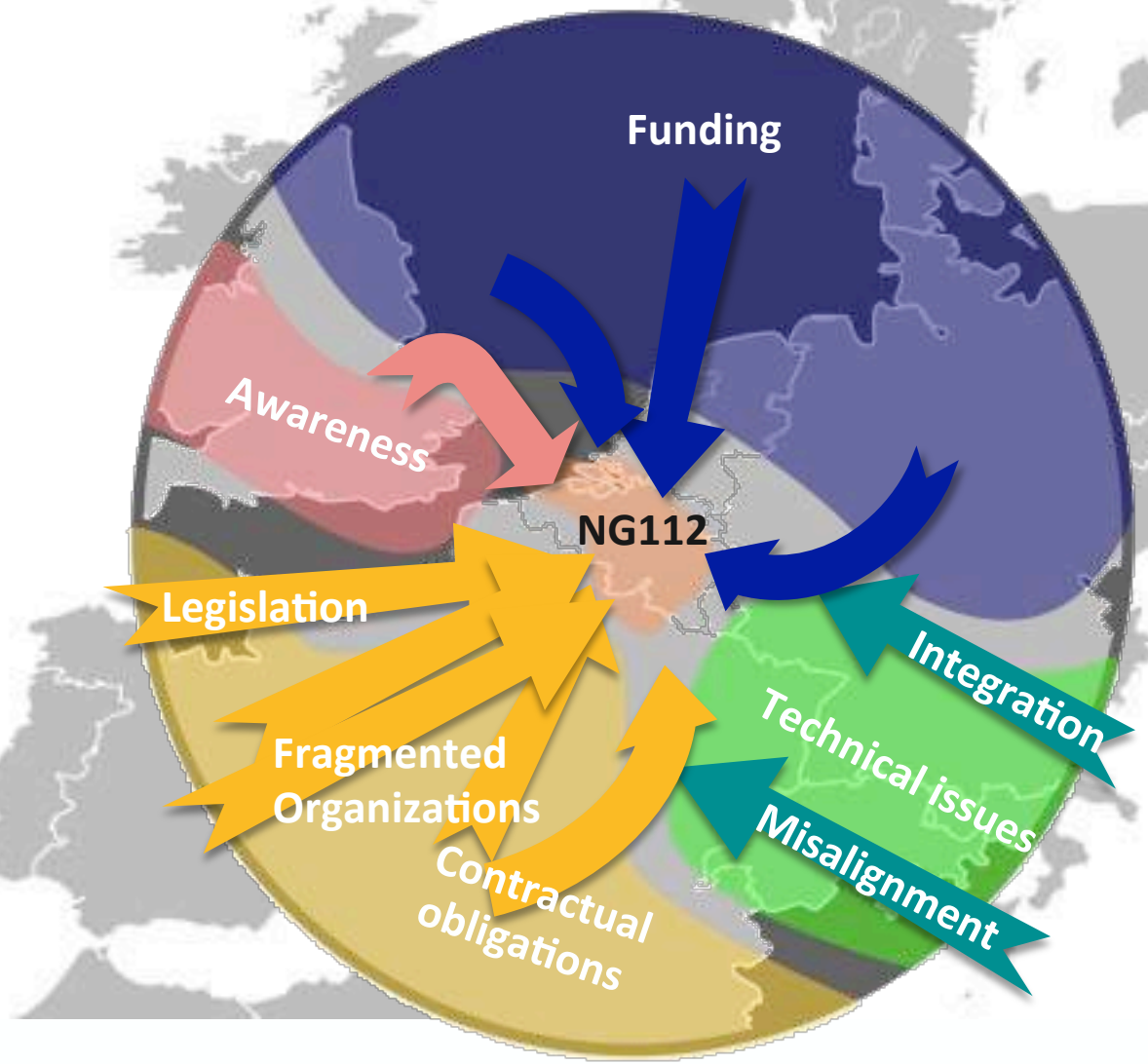


Evolution of communications landscape

Multimedia capabilities and VoIP are becoming available in every single technology domain in the emergency networks

Q: Is Long Term Definition Architecture "Long Term" enough?

Next Generation Emergency Networks landscape

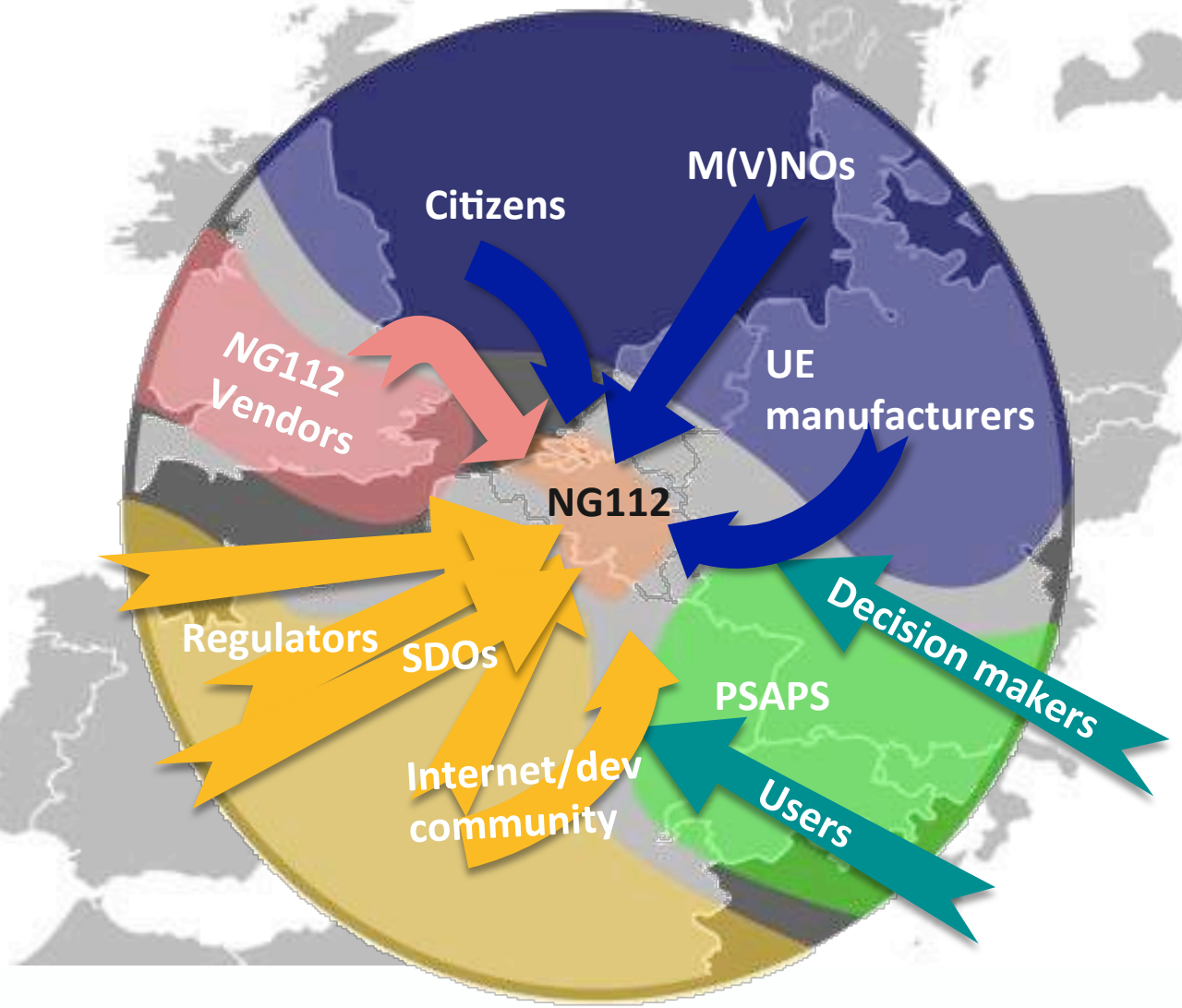


Not only technical impact

New Funding opportunities
New Emergency supra-national organizations in Europe
New legislation/harmonization?

Q: Will non-technical aspects become the key drivers to NG112 adoption?

Next Generation Emergency Networks landscape



Stakeholders

Specific “interest groups” may have a big relevance into NG112 evolution and success
Example: Mobile OS
Case Study 1: AML
Case Study 2: VoLTE/RCS

Q: How will specific stakeholders’ interests impact NG112?

Conclusions

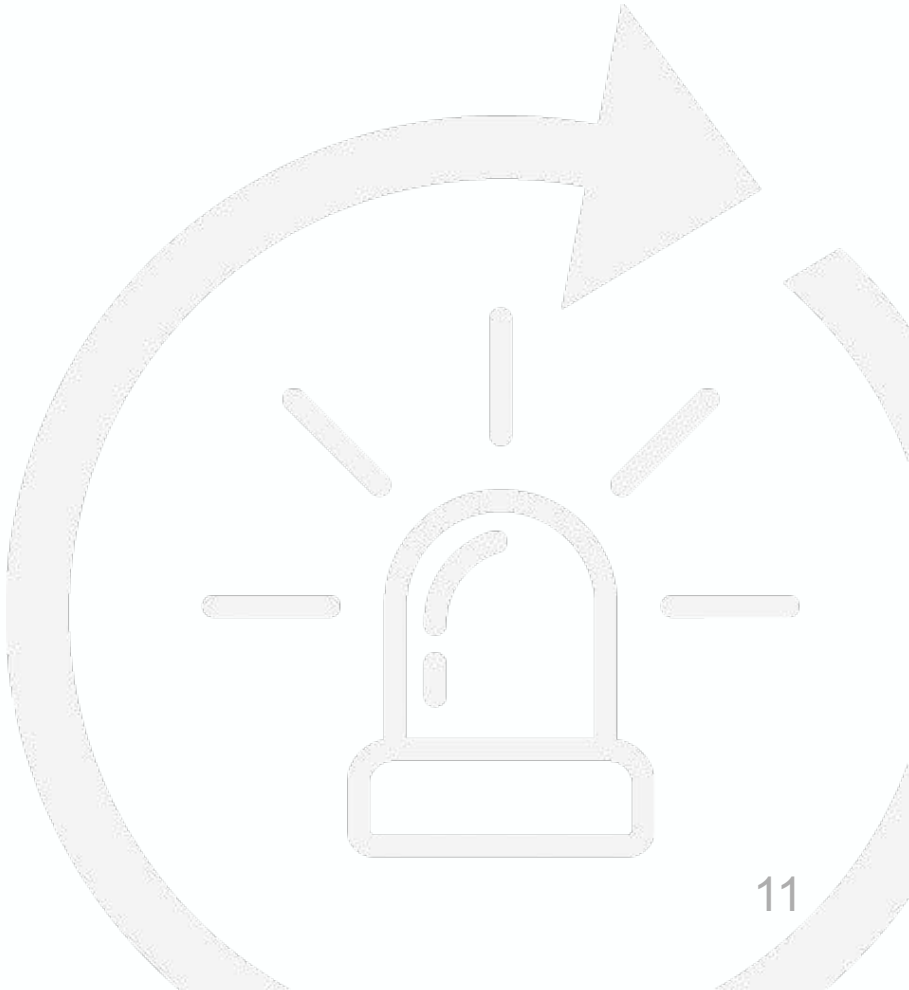
- Both general purpose- and emergency- communications landscape have significantly evolved since NG112 LTD architecture was initially conceived
- Furthermore, many factors which will likely affect NG112 evolution are not technical ones
- A revision of new technologies and stakeholders' positions needs to be carried out to check NG112's health and longevity
- After the analysis we should be able to answer to the following …

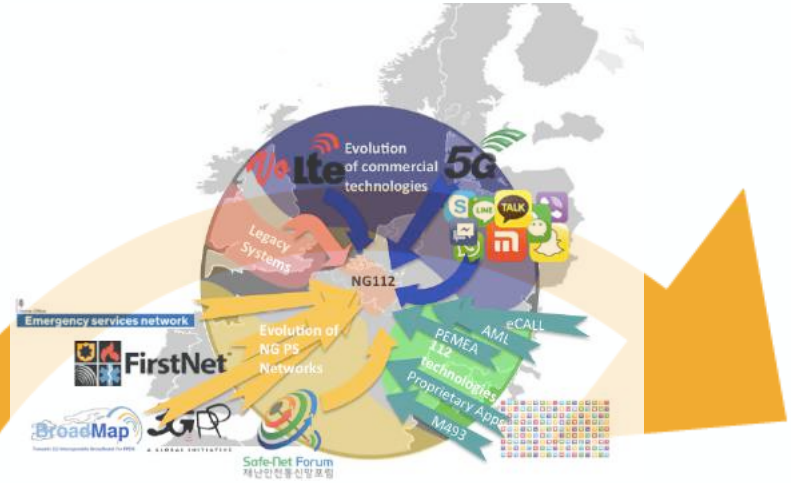
… questions

Will new technology/situation X probably…

- …replace …
- …complement …
- …push …
- …delay …

…*NG*112?



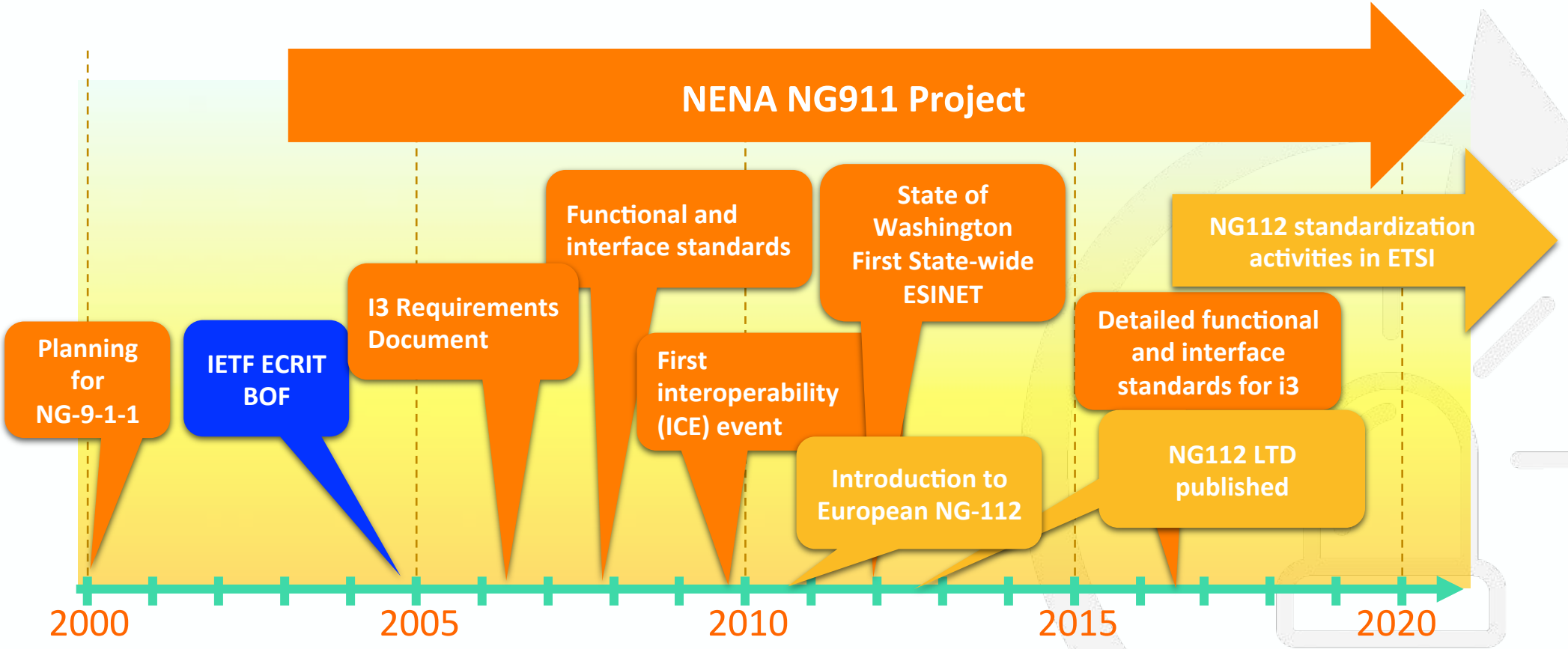


CHAPTER 2

EENA NG112

History of NG112 architecture

- NG9-1-1 & NG112



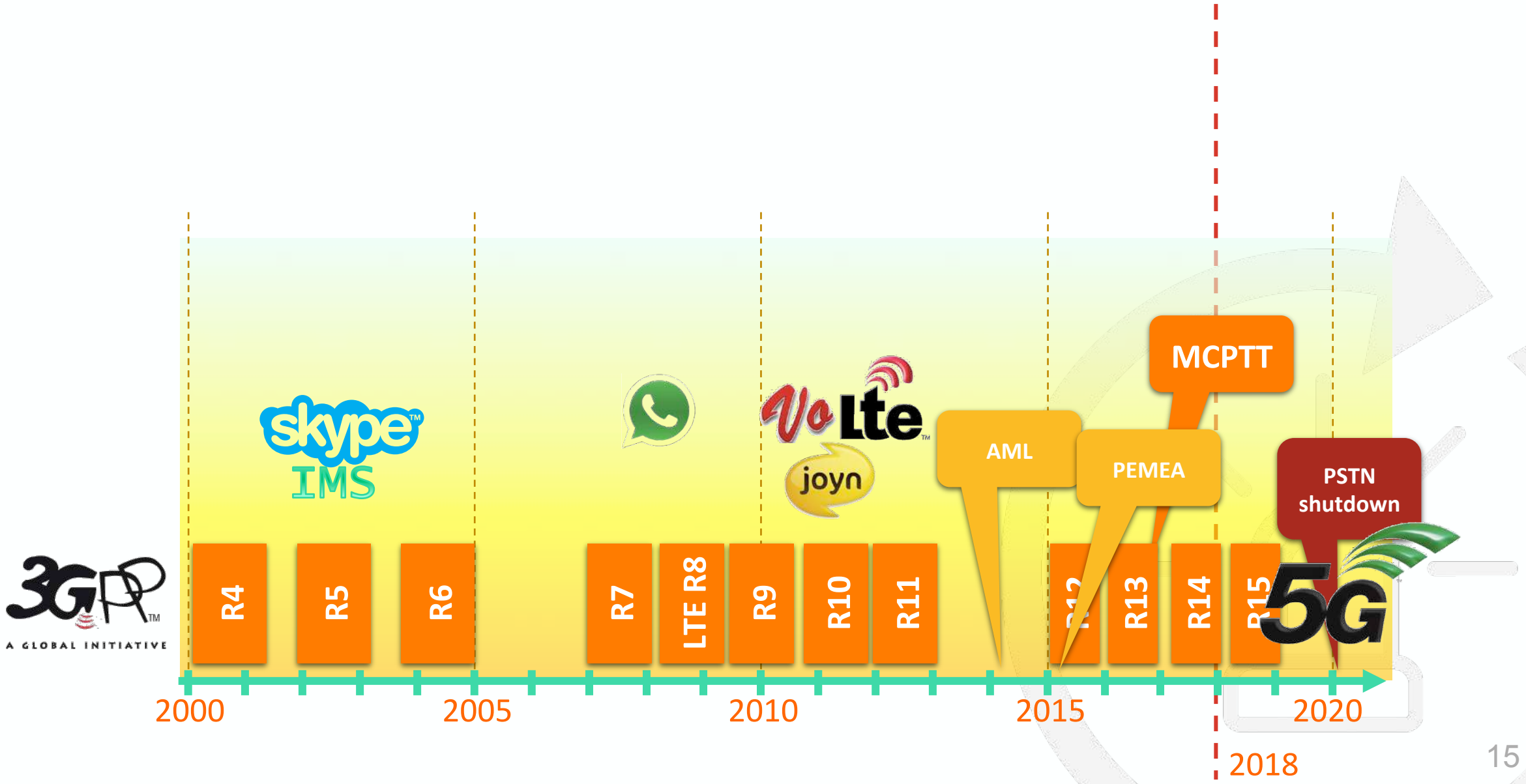
Ref: http://www.nena.org/resource/resmgr/ng9-1-1_project/ng9-1-1_history.pdf

History of NG112 architecture

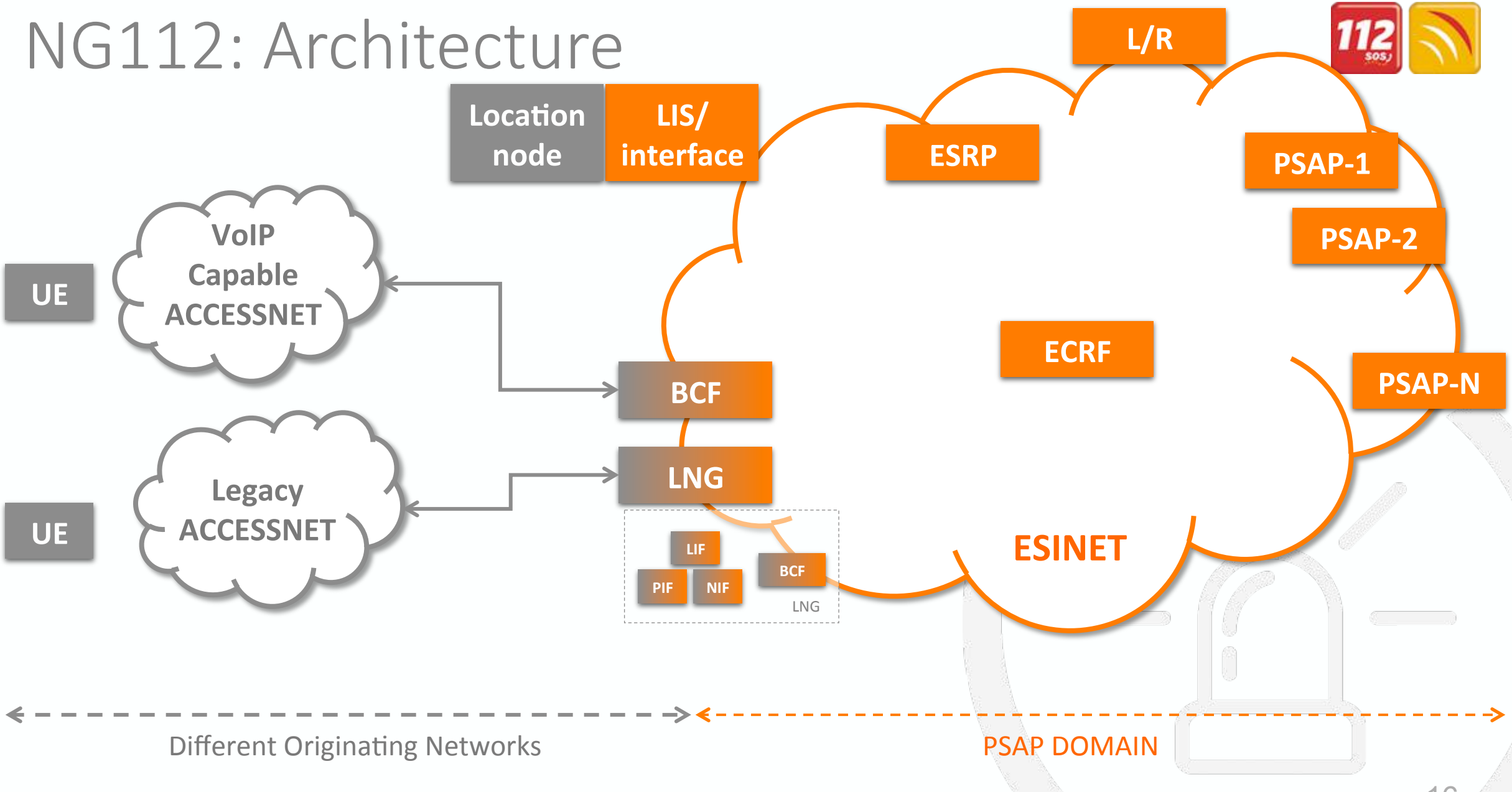
- I3 Architecture from NENA's NG9-1-1

Doc Number	Doc Name	Approved Date
NENA-STA-010.2-2016 (originally 08-003)	Detailed Functional and Interface Standards for the NENA i3 Solution	2016/09/10
NENA/APCO-REQ-001.1.1-2016	NENA/APCO NG9-1-1 PSAP Requirements Document	2016/01/15
NENA-INF-009.1-2014	Requirements for a National Forest Guide Information Document	2014/08/14
NENA-INF-006.1-2014	NG9-1-1 Planning Guidelines Information Document	2014/01/08
NENA-INF-003.1-2013	Potential Points of Demarcation in NG9-1-1 Networks Information Document	2013/03/21
08-506	Emergency Services IP Network Design for NG9-1-1 Information Document *****Update In Progress*****	2011/12/14
57-750	NG9-1-1 System and PSAP Operational Features and Capabilities Requirements Document	2011/06/14
73-501	Use Cases & Suggested Requirements for Non-Voice- Centric Emergency Services Information Document	2011/01/11
08-002	Functional and Interface Standards for Next Generation 9-1-1 Version	2007/12/18
08-505	Methods for Location Determination to Support IP-Based Emergency Services Information Document	2006/12/21
08-752	Location Information to Support IP-Based Emergency Services Requirements Document	2006/12/21
08-751	NENA i3 Requirements Document	2006/09/28
08-502	E9-1-1 Requirements Information Document	2004/07/23
08-501	Interface between the E9-1-1 Service Provider Network and the Internet Protocol (IP) PSAP Information Document	2004/06/15

Meanwhile


skype
IMS
VoLte
joyn
MCPTT
AML
PEMEA
PSTN shutdown
3GPP
A GLOBAL INITIATIVE
R4
R5
R6
R7
LTE R8
R9
R10
R11
R12
R13
R14
R15
5G
2000
2005
2010
2015
2020
2018

NG112: Architecture



NG112: Main characteristics

- “Driven” by PSAP industry and users (grouped in NENA/EENA)
  - To be revisited upon new communications paradigms (unbound/unregulated)
- Evolution of 112 to (Vo)IP
  - Voice+Video+RTT capable
  - Location conveyance by value/reference possibly assisted by different nodes
  - Advanced call routing considering PSAPs’ specific demands
- Originating network agnostic (before All-IP networks)
  - LNG+BCF as the key enablers for multiple heterogeneous originating networks
- Different PSAP models
  - Emergency calls are delivered in the BCF “Point of Presence” and internally routed according to “complex” PSAP-defined ESINET policies

Ref:EENA LTD 1.1

NG112: Key technologies/protocols

- Signalling:
  - Overall
    - SIP/RTP
      - Use of SOS service urn for emergency call routing
  - Location querying/retrieval/update
    - Geolocation header (by value/by reference)
      - PIDF-LO
    - By Value
      - Multipart MIME body
    - By Reference
      - HELD (HTTP transport)
      - SIP subscribe/notify mechanisms (SIP simple)
  - LOST
    - Location to service mapping, HTTP transport

Ref:EENA LTD 1.1

NG112: Key technologies/protocols

- Media
  - Codec
    - Audio: G.711 (u and a laws) mandatory. AMR, AMR-WB, EVRC-* recommended
    - Video: H264/MPEG-4 10 Baseline profile mandatory. Scalable Baseline recommended
    - Non-human: CAP, EDXL
  - Messaging
    - RTT (RFC 5194 and 4103)
    - IM: SIP/SIMPLE & MSRP

Ref:EENA LTD 1.1

NG112: Current status

- NG112
  - Plugtest events' conclusions
    - 15 organizations (Asia, Europe, North-America)
    - NG112 core elements stable
  - Commercial status
    - Term appearing in tenders
    - NG112 "buzzword"?

Company	UE/APP	IMS	UC	PIF	NIF	BCF	LIS	ESRP	ECRF	PSAP
XXXXX				X	X					
XXXXX	X	X								
XXXXX			x							X
XXXXX	X									
XXXXX	X						X	X	X	X
XXXXX							X		X	
...										
XXXXX	X		X				X			
XXXXX	X							X	X	X
XXXXX						X				
XXXXX					X	X				
XXXXX										X
AVAILABILITY	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Ref: http://www.eena.org/publications/next-generation-112-report-of-ng112-communications-plugtests-event-now-available

NG112: Current status

- NG9-1-1

Recording Systems Ready for Next Generation 9-1-1

Recording systems span all forms of Next Generation 9-1-1 (NG9-1-1) communications in a unified solution, including inbound and outbound text messages agnostic to text aggregation solutions or delivery methods - Direct IP, Web Int

Tested at all NENA Industry

uture-proof platform

the European

will provide its mul

This innovative public s

investment's future reliability

as eCall, NG112 emergency c

messaging, images and more)

ECRF is

services to NG9-1-

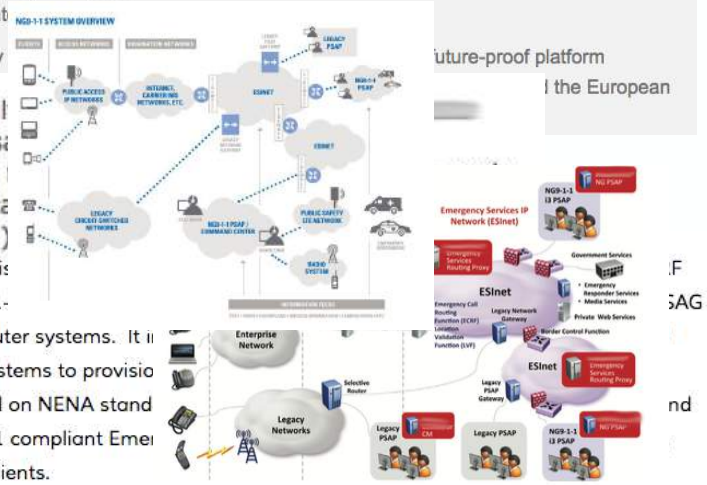
and Selective Router systems. It

quality control systems to provisio

frequency. Based on NENA stand

model of NG9-1-1 compliant Emer

and other LoST clients.



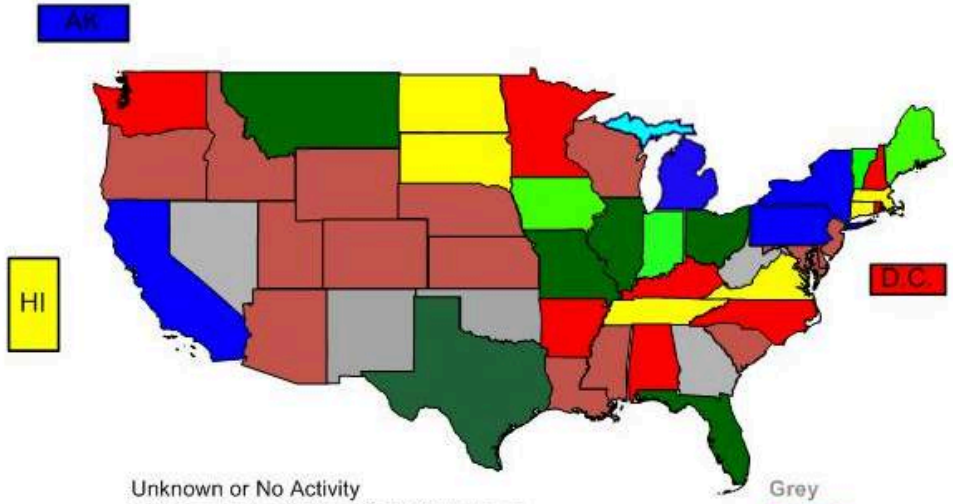
includes:

- **Next-Generation 9-1-1 Capabilities –** SIP-based and architected to meet existing and emerging NENA NG9-1-1 i3 standards. Compatible with Emergency Services IP Networks (ESInets).

National Progress on IP Network, ESInet and NG9-1-1

Below is a color-coded map summarizing status:

Transitional NG9-1-1 Progress by State



Unknown or No Activity	Grey
IP Network Available at Sub-State Level	Fuchsia
IP Network Available at State Level	Light Blue
NG9-1-1 Planning Started	Light Brown
NG9-1-1 Preparation Activity at Sub-State Level	Blue
NG9-1-1 Preparation Activity at State Level	Red
NG9-1-1 Implementation in Progress at Sub-State Level	Dark Green
NG9-1-1 Implementation in Progress at State Level	Yellow
NG9-1-1 Implemented at Sub-state Level	Turquoise
NG9-1-1 Implemented at State Level	Green

***DISCLAIMER*: THIS MAP IS A HIGH LEVEL GENERALIZED SNAP SHOT AND IS NOT INTENDED AS A REPLACEMENT FOR OBTAINING SPECIFIC INFORMATION FROM AREAS ON THEIR DETAILED CURRENT STATUS.**

National-wide LOST routing still an issue

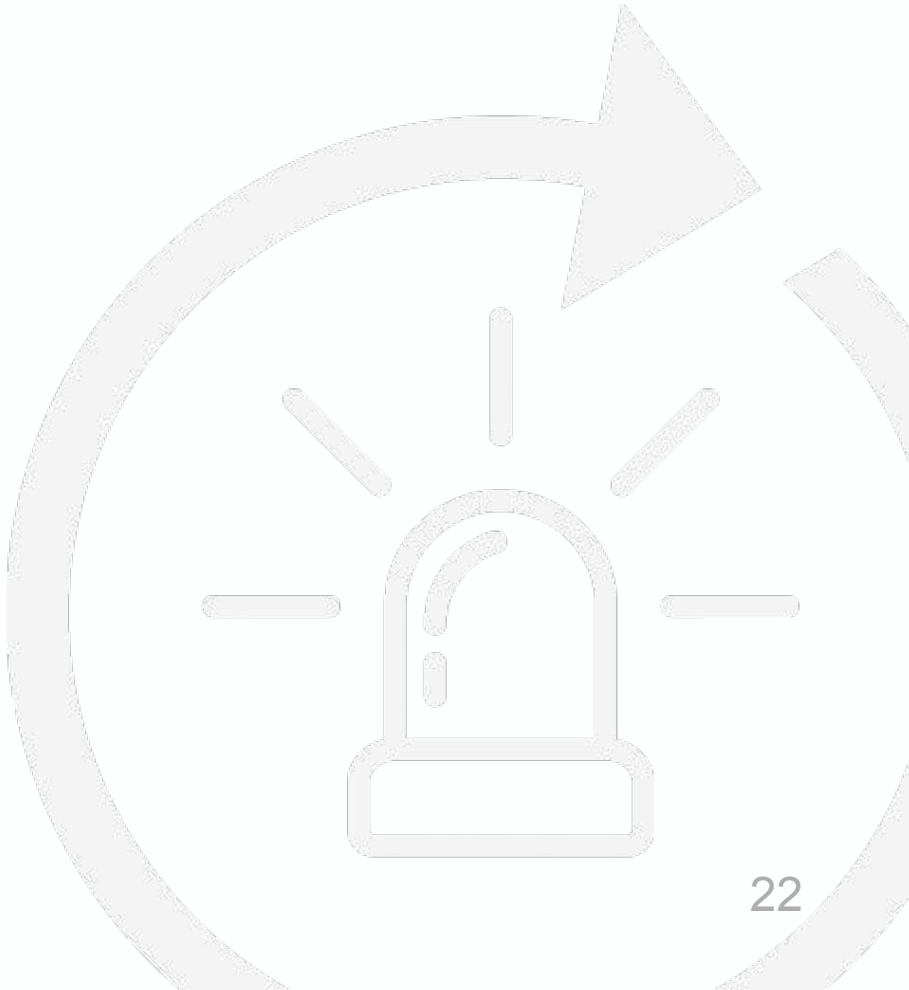
Ref: http://www.nena.org/?NG911_StateActivity

Analysis of new landscape

Is EENA NG112 …

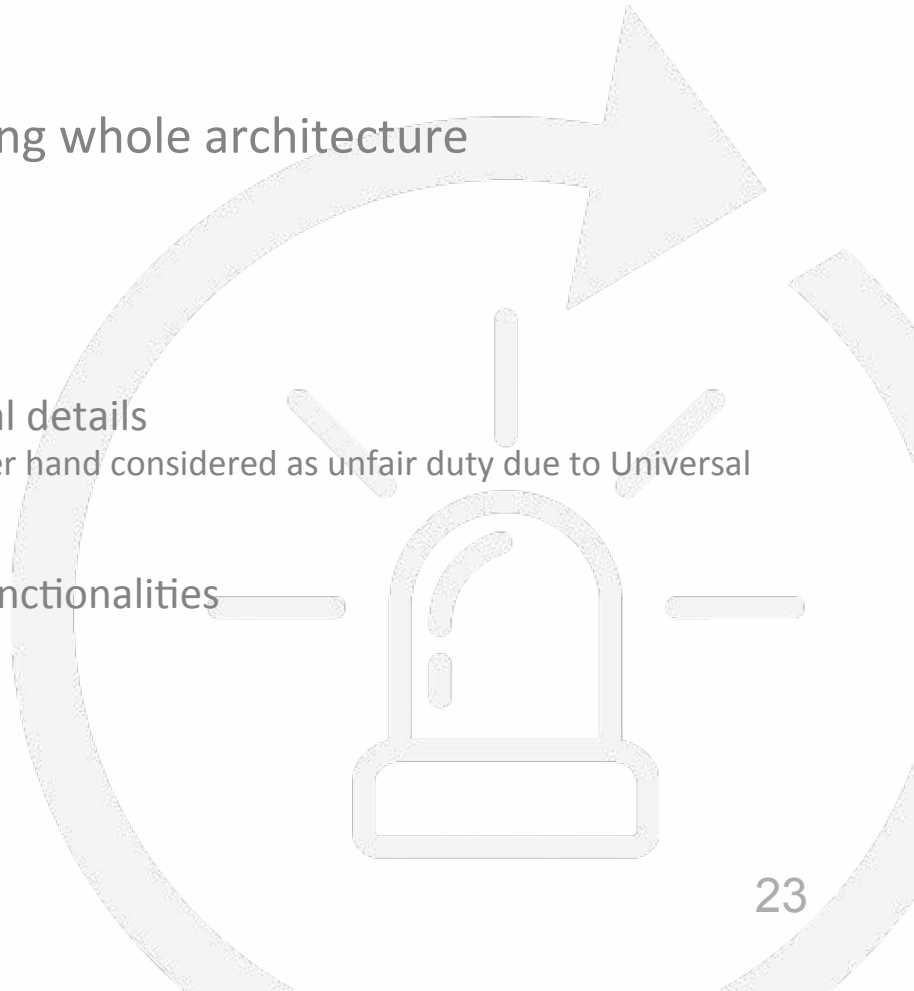
- …pushing …
- …delaying …

…*NG*112?



Analysis of NG112 & new landscape

- Technical interoperability questions
  - NG112 specific SIP headers and MIME formats ⇔ SBCs, other SIP based systems
  - Codecs
    - To be analysed in a p2p basis
- Concerns of the need for standard solutions (at all) and standardizing whole architecture
  - LTD based on standardized (i.e. by IETF) protocols and data formats
  - Debate in the US on NG911 standard/NENA SDO status
  - Standardization activities in ETSI ongoing
- Lack of awareness
  - Telco world not fully familiar with NG112 architecture and actual technical details
    - Is emergency call routing by any means a business case for M(V)NOs or on the other hand considered as unfair duty due to Universal Service directives
  - Advantages of having a standards-based solution
  - Multiple local-only and proprietary apps allegedly providing equivalent functionalities
- SIP still the mostly used/best candidate?
  - WebRTC
- Missing (regional/national/european) level harmonization



Analysis of NG112: already taken measures

Recommendations

Item	Action
Roadmap	» The national/regional public authority in charge of PSAPs should take the lead on making recommendations to PSAPs on migration to 112. » PSAPs should demand to national/regional authorities to take the lead on NG112. » A European forum for exchange of experience and best practices during transition is needed. » Creation of a national/regional Working group on NG112 and on how to migrate toward NG112 » Create cost & benefit analysis.
Others	» If PSAPs consider to renew technology, they should think about NG112 » PSAPs don't need to wait until public infrastructure or others emergency services have NG112. » Use transition steps: standard interfaces, data formats
Timeframe	» Set up working groups on NG112 transition as soon as possible » Consider when to provide the entry point to the Esinet as a first step » Inputs on how advanced the industry is will be available after the NG112 emergency communications interoperability Plugtests event in March 2016.

Ref: EENA workshops reports 2015 and 2017

Recommendations

Item	Action	Stakeholder
Communication	Communicate about NG112 components	Technology providers
Communication	Why NG112 should be deployed now: • Highlight the risk of proprietary solutions • Highlight technological neutrality • Some aspects of the concept are still not clear	EENA
Tenders	When making upgrades or implementing new features focus on NG112	Public authorities Technology providers
Tenders	Challenge the industry, ask for NG112	Public authorities

Next steps for EENA

PLUGTESTS EVENT

3rd edition of the plugtest event

STANDARDISATION

Finalise standardisation work inside ETSI

STANDARDS PROMOTION

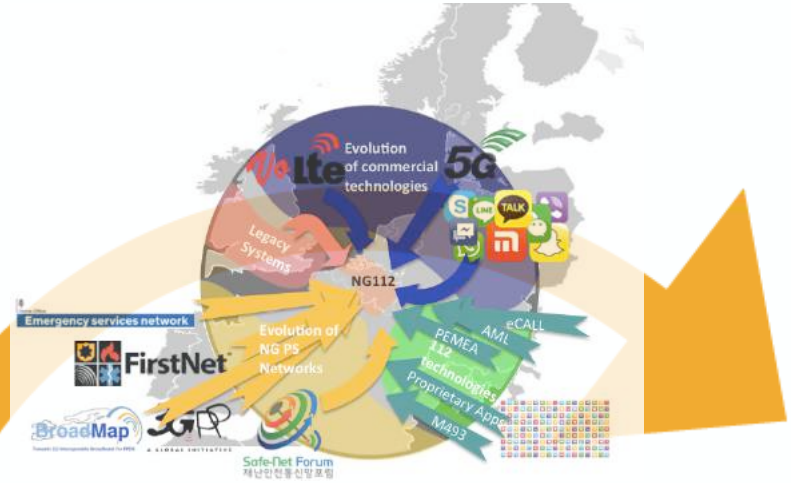
Promote the use of ETSI Standards once they have been published

WEBINAR

Webinar about NG112 concept (stakeholders' responsibilities and networks compatibilities between others)

Conclusions

- NG112 LTD architecture is based on i3 from NENA
  - Definition over the last decade
  - Driven by the PSAP community (users and industry)
  - Uses standardized and well known protocols (SIP/RTP, HELD, LOST) and codecs
- Main purpose
  - VoIP, total conversation and location
  - Different PSAP models (emergency call routing policies in the ESINET)
  - Accommodating different originating networks
    - Before networks moving to all-(Vo)IP
    - “No need” for NG112 app but could reuse native multimedia capabilities (i.e. by accommodating VoLTE)
- Current status
  - Slow adoption in Europe, sometimes due lack of awareness and misunderstanding
  - Need to fight with proprietary “NG”112 solutions
    - Value of standardized solutions apparently unclear for purchasers
  - New role of paradigm-shifting technologies (unregulated/uncontrolled) still unclear
  - Unclear share of responsibilities for deployments
    - Operators due to Universal Service directives?
    - Emergency bodies/Control Centres
    - What happens with unregulated communication islands (WhatsApp, Skype, Line, FB Messenger, Google Talk)?

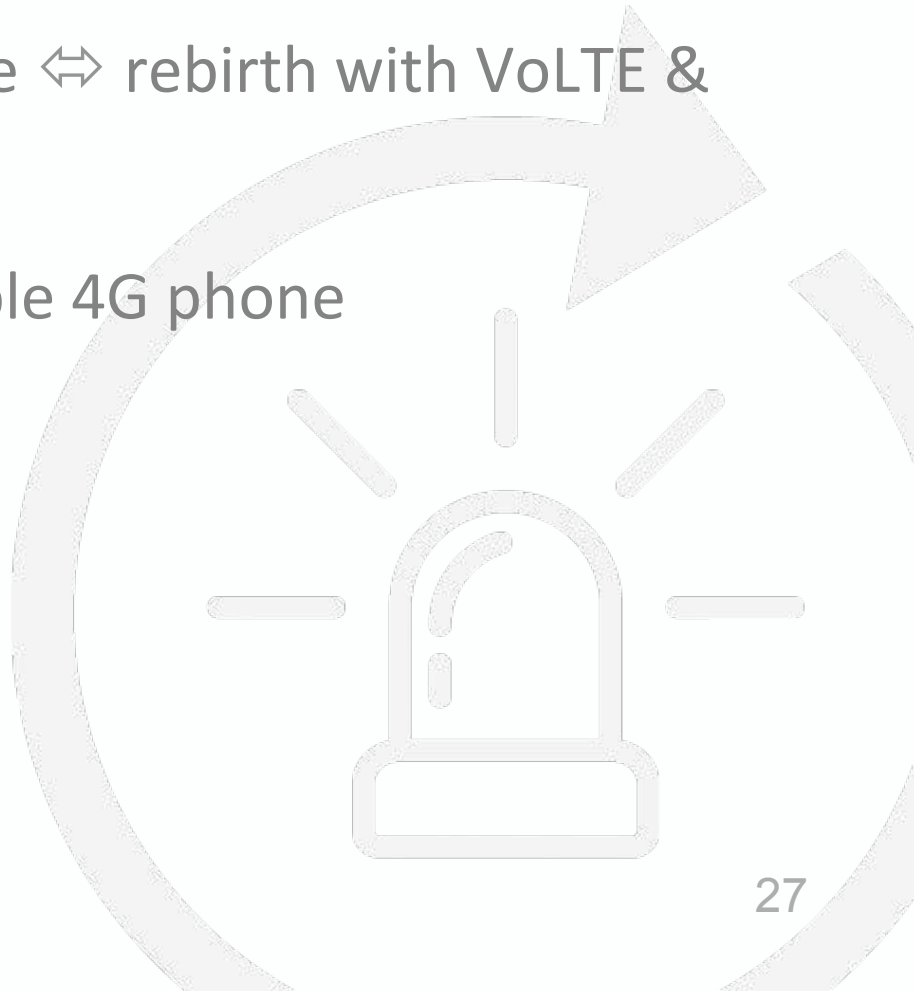


CHAPTER 3

IMS

IMS: Main characteristics

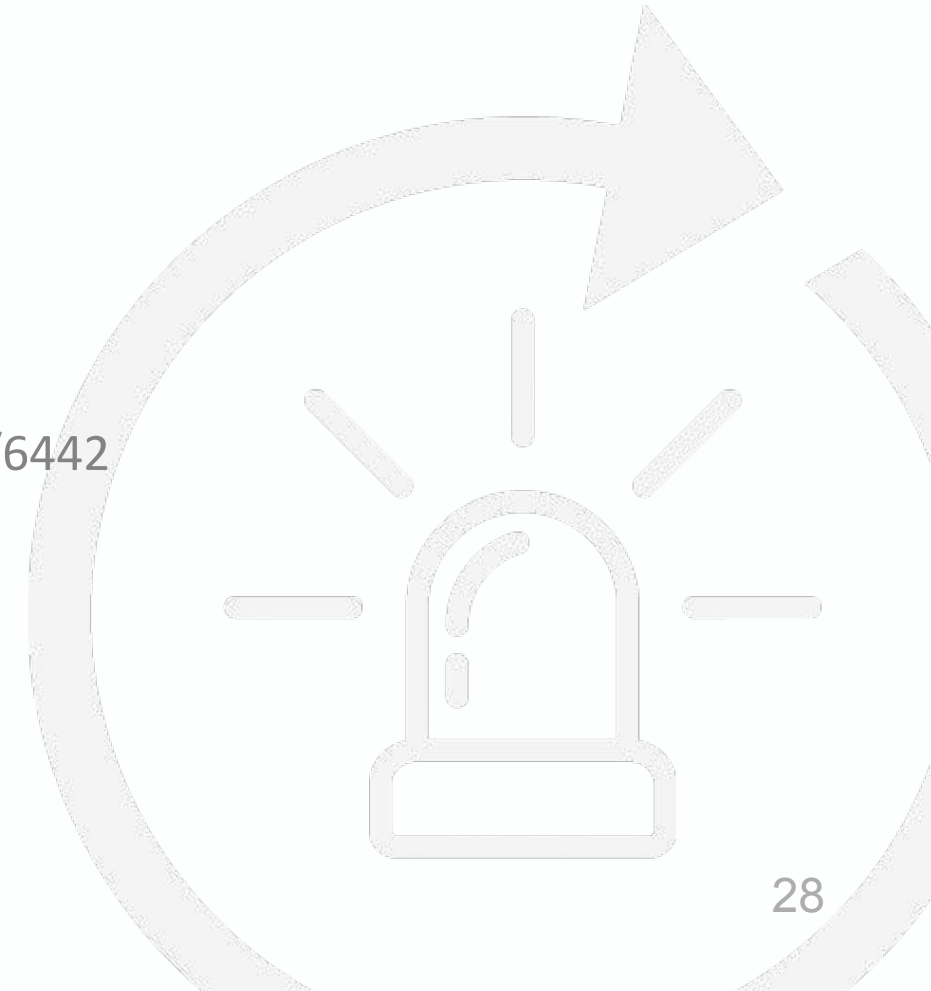
- Defined by 3GPP Release 5
  - Driven by telco vendors
- From initial hype ⇔ long period of no-business-case ⇔ rebirth with VoLTE & PSTN shutdown
- VoLTE != IMS != RCS
- Emergency calling builtin in every VoLTE+RCS capable 4G phone
  - IMS+LTE (emergency) registration
  - No need for additional app
- Identification: SIM/IMEI based
- Location:
  - Geolocation Header: UE, LRF (by reference)
  - P-ANI: P-CSCF, S-CSCF



Ref: TS24229

IMS: Key technologies/protocols

- Signalling:
  - Overall
    - SIP/RTP
      - Specific headers+tags
        - in overall IMS
        - specific to VxLTE
  - Location conveyance in emergency sessions
    - If location/URI is available in the UE=> PIDF-LO RFC 4119/6442
    - Other (Network assisted)

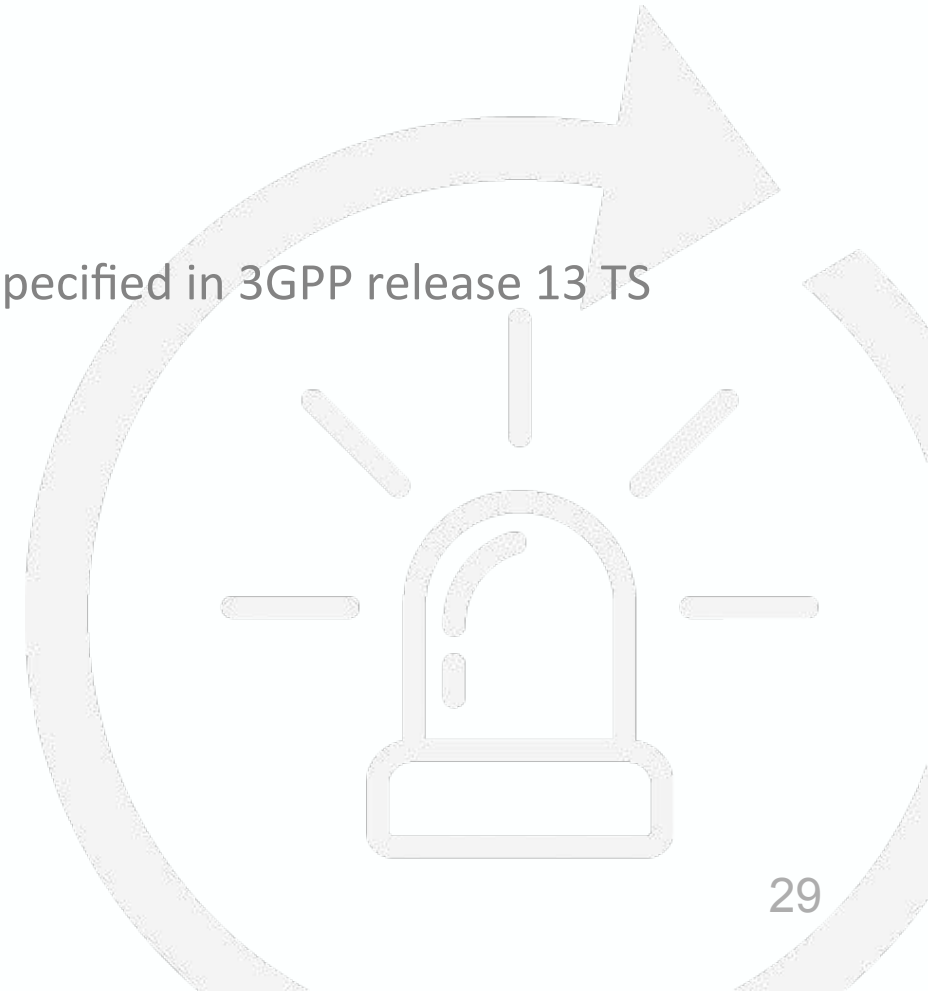


Ref: TS24229

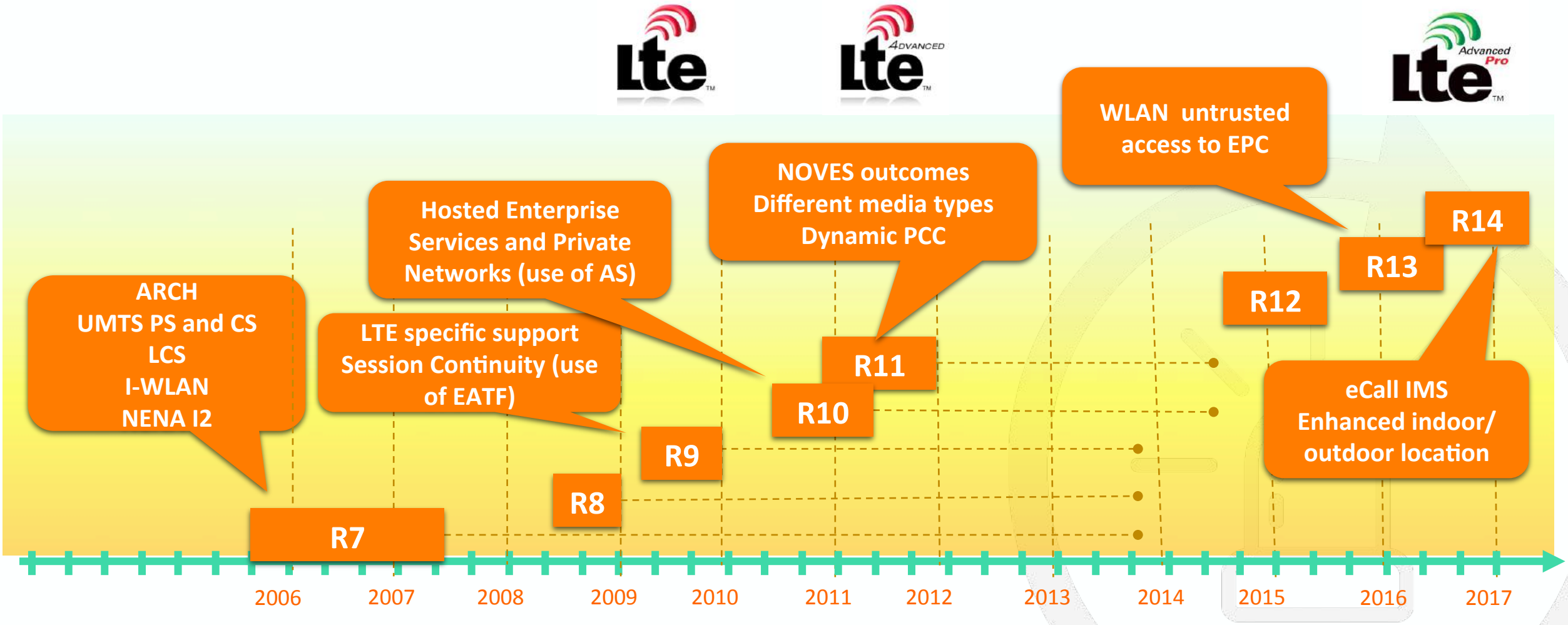
IMS/VxLTE/RCS: Key technologies/protocols

- NOTE: VxLTE-RCS => subset of IMS (GSMA)
- Media
  - Codec
    - Audio: AMR & AMR-WB mandatory, EVS optional
    - Video: H.264 Constrained High Profile (CHP) Level 3.1 as specified in 3GPP release 13 TS 26.114
  - Messaging
    - SIP Message
    - RTT
      - Telephony services TS 26114
        - ITU T-140 (RFC 4103)
    - MSRP

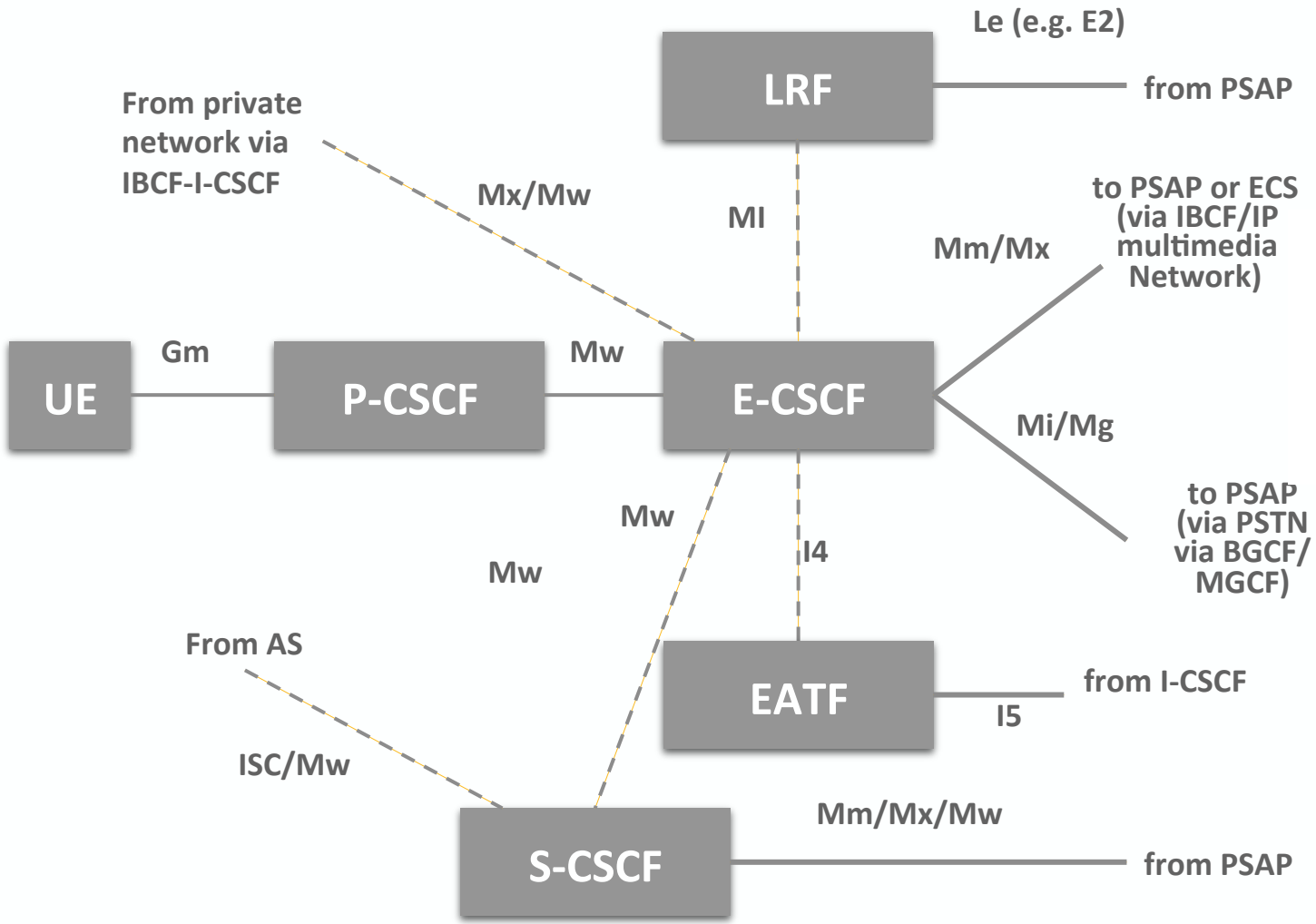
Ref: GSMA IR.92, GSMA IR.94



Evolution of emergency calling 3GPP TS 23.167



IMS: emergency calling architecture



This document covers also the Access Network aspects that are crucial for the provisioning of IMS emergency services. Other 3GPP specifications that are related to the IMS emergency services are TS 23.228 [1] on IMS in general, including fixed broadband access aspects, TS 23.060 [2] describing GPRS (UTRAN), TS 23.401 [28], TS 23.060 [2]; TS 23.402 [29] describing EPS (UTRAN and E-UTRAN); TS 23.234 [7] describing 3GPP/WLAN Interworking; TS 23.271 [5] that covers location services and TS 23.216 [31] and TS 23.237 [32] describing Single Radio Voice Call Continuity for IMS Emergency session. TS 25.301 [6] contains an overall description of the UMTS Terrestrial Radio Access Network TS 36.300 [30] contains an overall description of the Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN). Other non-3GPP specifications that are related to the IMS emergency services include 3GPP2 cdma2000 HRPD IP-CAN, as specified in 3GPP2 X.S0060 [25] when the UE is connected to a PDS core network and 3GPP2 X.S0057-A [39] when the UE is connected to an EPC core network.

The emergency support in different IP-CANs is described in the Informative Annex E.

NOTE1: little reference to non-3GPP access originating networks

NOTE2: Legacy and i2 PSAP as final destination

NOTE3: Le (i.e. GMLC not directly considered as LIS interface in NG112)

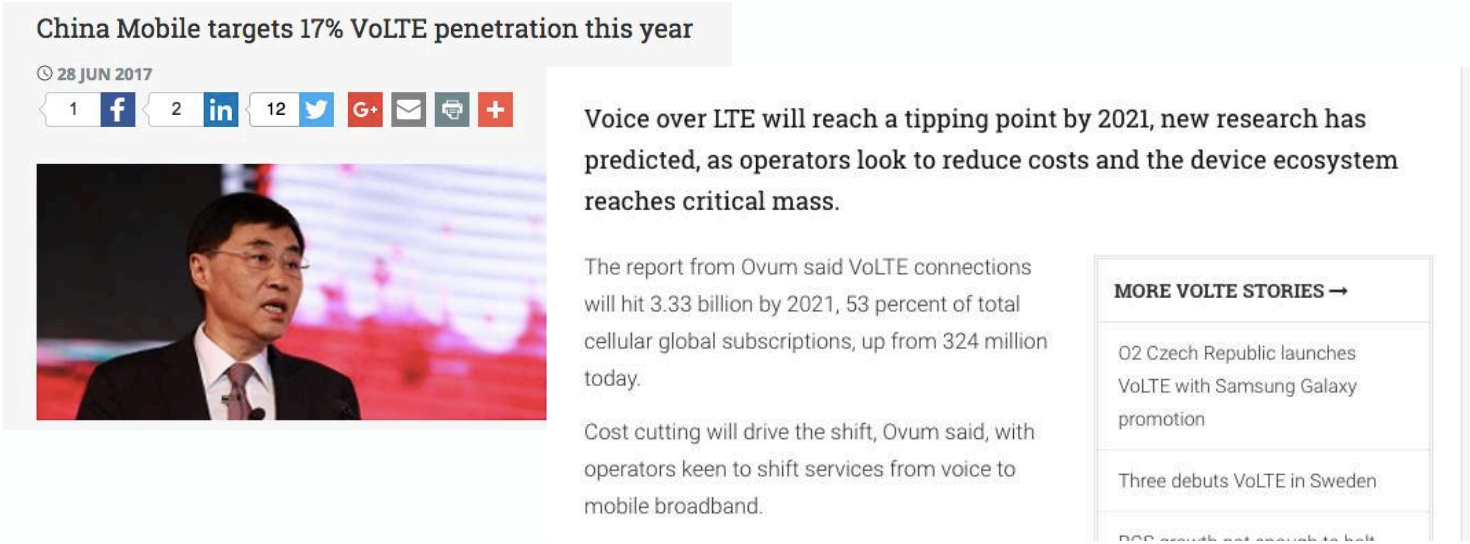
Analysis of IMS

Type of emergency service: The type of emergency service is either an emergency call type standardized by 3GPP (see 3GPP TS 22.101 [8] subclause 10.1) or a similar capability not standardised by 3GPP and defined by national regulatory requirements. The generic (sos) service, identified by urn:service:sos, does not have a type of emergency service (even though usage of the generic (sos) service in the emergency call is defined). ¶

- Main concerns identified
  - Alignment of NG112 with IMS
    - SOS urn IMS => COMPATIBLE
      - TS 24229
        - Section 5.1.6.8.X (reference to TS 22101) and use of urn:service:sos in R-URI in originating UE
    - MSRP/SIP simple presence
    - Deployment issues
      - SBC & SOS urn

IMS/RCS/VoLTE status

- IMS gaining momentum
  - Not only VoLTE but replacement of SS7/PSTN
- IMS will be probably incorporated into 5G



China Mobile targets 17% VoLTE penetration this year

28 JUN 2017

1 2 12

Voice over LTE will reach a tipping point by 2021, new research has predicted, as operators look to reduce costs and the device ecosystem reaches critical mass.

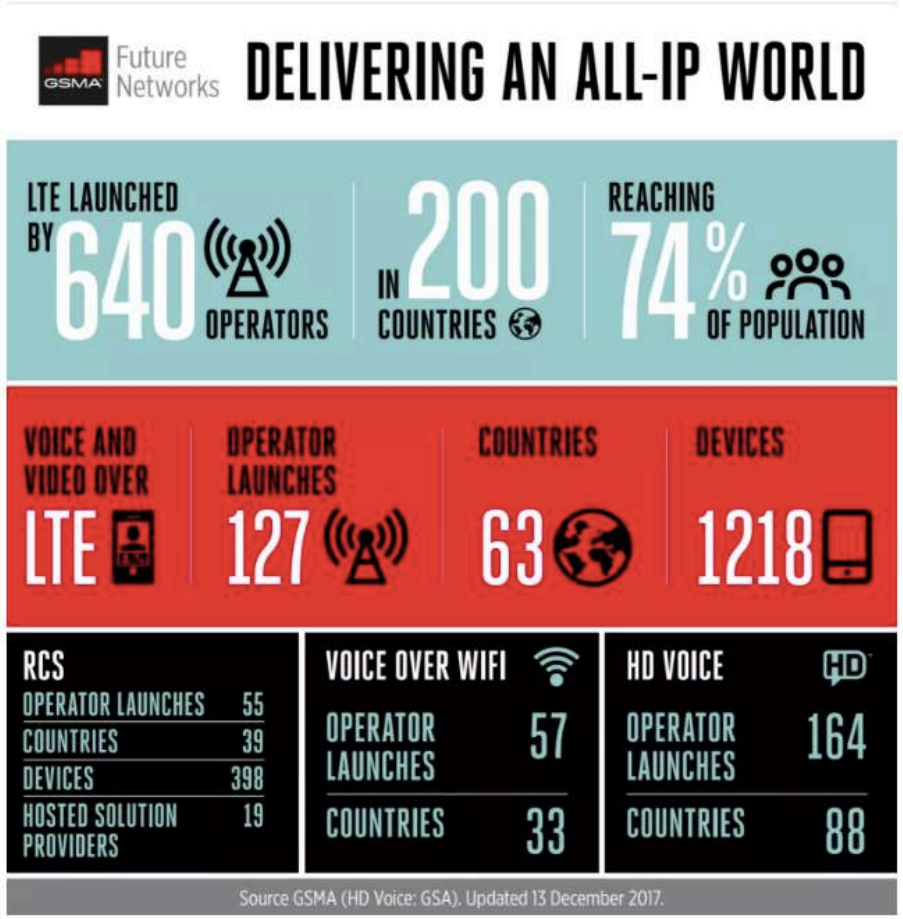
The report from Ovum said VoLTE connections will hit 3.33 billion by 2021, 53 percent of total cellular global subscriptions, up from 324 million today.

Cost cutting will drive the shift, Ovum said, with operators keen to shift services from voice to mobile broadband.

MORE VOLTE STORIES →

O2 Czech Republic launches VoLTE with Samsung Galaxy promotion

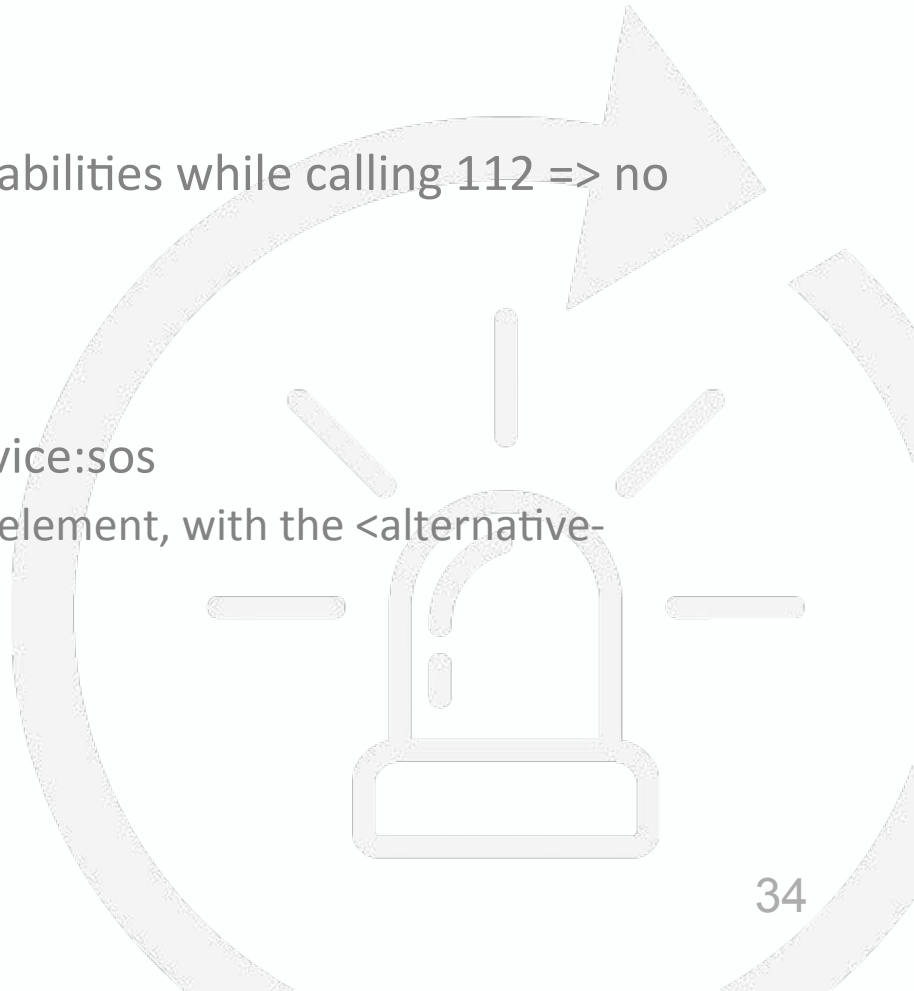
Three debuts VoLTE in Sweden



Ref: https://www.gsma.com/futurenetworks/resources/all-ip-statistics/

IMS and emergency calling: current status

- Most IMS cores do not support native emergency calling
  - Due to the lack of:
    - NG-capable-PSAPs
    - regulatory obligation to provide multimedia exchange capabilities while calling 112 => no “business case”
    - legacy PSTN “breakout” mechanisms in place
  - In 4G => CS fallback
    - If the P-CSCF recognizes an emergency number or urn:service:sos
      - 380 Alternative Service with and XML body ⇔ <ims-3gpp> element, with the <alternative-service>.
      - The UE attempts the CS domain.



NG911 and IMS

Ref: NG911 Standards identification and Review March 2017

- ATIS

- ATIS-0500030: *Guidelines for Testing Barometric Pressure-Based Z-Axis Solutions*
- ATIS-0500031: *Test Bed and Monitoring Regions Definition and Methodology*
- ATIS-0500032: *ATIS Standard for Implementation of an IMS-based NG9-1-1 Service Architecture*
- ATIS-0700025. *CMAS International Roaming Specification*
- ATIS-0700028: *Location Accuracy Improvements for Emergency Calls*
- ATIS-1000066.2016: *Emergency Telecommunications Service (ETS) Network Element Requirements for IMS-based Next Generation Network (NGN) Phase 2*
- ATIS-1000070: *Emergency Telecommunications Service (ETS) Roadmap*
- ATIS-1000071: *Technical Report on a Nationwide Number Portability Study*
- ATIS-1000072: *Analysis of Mitigation Techniques for Calling Party Spoofing*
- J-STD-110.v002: *Joint ATIS/TIA Native SMS/MMS to 9-1-1 Requirements and Architecture Specification, Release 2*
- J-STD-110.01.v002: *Joint ATIS/TIA Implementation Guideline for J-STD-110, Joint ATIS/TIA Native SMS/MMS to 9-1-1 Requirements and Architecture Specification, Release 2*

The National 911 Program

Next Generation 911 (NG911) Standards Identification and Review

Document Name:	ATIS Standard for Implementation of an IMS-based NG9-1-1 Service Architecture
Document Date:	November, 2016
Document Number:	ATIS-0500032
Document Version:	
Committee:	ESIF
Collaborating Forum(s):	
Document Type:	Standard
Abstract:	This Standard defines the Stage 2 (architecture) and Stage 3 (protocol) specifications for an IMS-based NG9-1-1 Service Architecture. This Standard includes the architecture, functional elements, call flows, protocols, and interfaces which were derived from the Stage 1 requirements in ATIS-0500023, "Applying Common IMS to NG9-1-1 Networks".
Formats Available:	Paper Copy: $470.00 - Add to Cart Electronic Download: $415.00 - Add to Cart CD-Rom: $470.00 - Add to Cart
File Size:	
Number of Pages:	137

NG911 and IMS

Ref: ATIS 0500032

- Next Generation 9-1-1 network and emergency call processing architecture based on:
  - contributions received since 2011
  - requirements by a number of wireless carriers to have an IP Multimedia Subsystem (IMS)-compatible NG9-1-1 design.
  - NENA i3 Architecture Working Group deferred the IMS-based ESInet development to ATIS.
- ATIS' goal in developing this standard has been transparent interoperability between the two network designs.
- ATIS' intent in this development work was to produce a standard method for IMS-based carriers to offer NG9-1-1 services wholly within their IMS platforms, while maintaining consistency and interoperability with the NENA i3 ESInet/NGCS (Next Generation Core Services) design goals.
  - transparency, both upstream and downstream between architectures, ensures that an i3 PSAP should find no difference whether the i3 PSAP interconnects to a NENA i3 ESInet with NGCS, or interconnects to an ATIS IMS-based NG9-1-1 Service Architecture.
- For entities early in the process of selecting ESInet solutions, the expectation within this ATIS development work was that the ATIS IMS-based NG9-1-1 Service Architecture would offer a choice for carriers that already had an IMS ecosystem, but not be considered a viable architecture choice for 9-1-1 service entities that had no plans for an IMS infrastructure.
- Public Safety entities should naturally understand the applicability of an IMS-based NG9-1-1 Service Architecture network approach to processing emergency calls, yet in this case, they can remain confidently focused on NENA i3-based NG9-1-1 architectures, (this is because IMS may be of interest to carriers, not to jurisdictions), which means that Public Safety's progress and momentum to adopt NG9-1-1 will not be impeded by the introduction of this ATIS NG9-1-1 Service Architecture standard.

IMS and emergency calling: current status

- Universal service directive should be applied to any VoIP call (not only but including IMS based)
- In any case emergency calling during (inter)national (i.e. unregistered) roaming not considered by national regulations

Table 23: Technical aspects defined in the national specification(s) – part 1

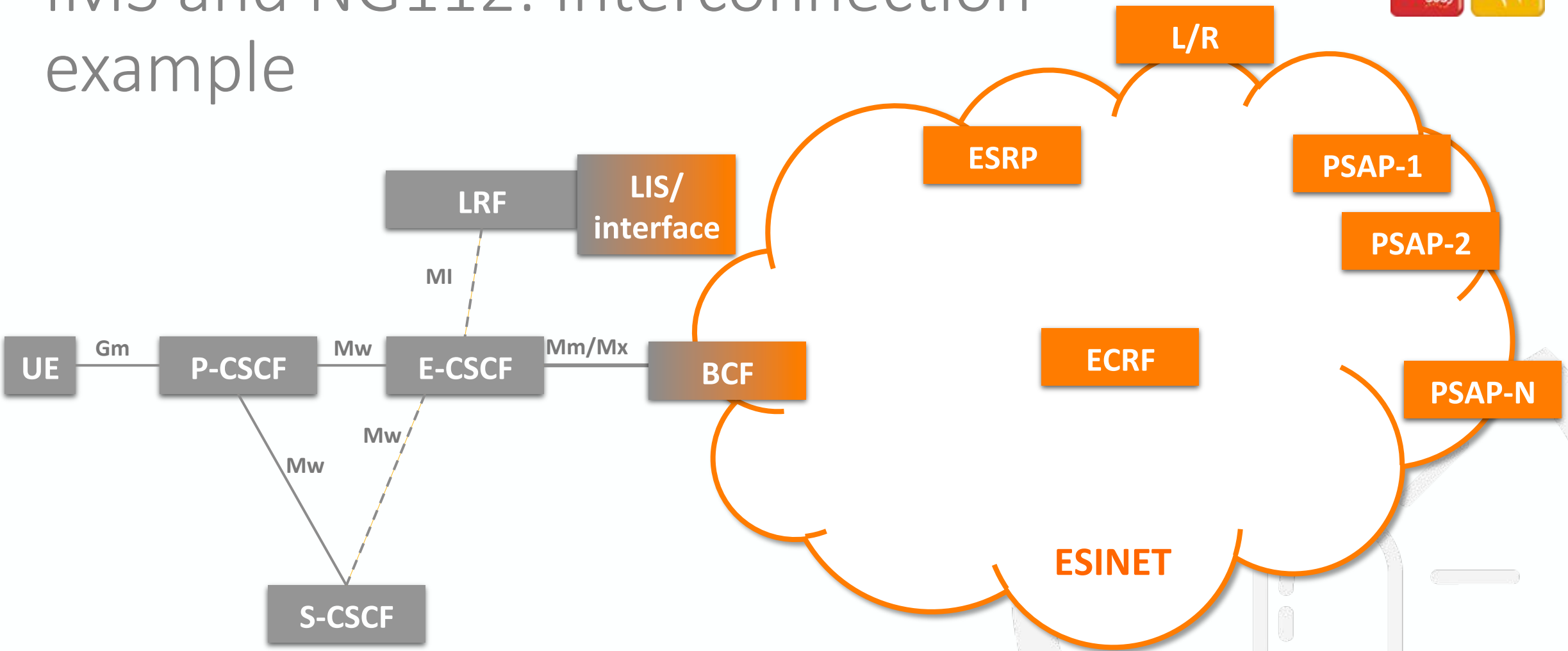
Characteristic	Denmark	France	Germany	Italy	Slovenia
Operator which offers IPvIC	TDC (incumbent)	Orange (incumbent)	DTAG (incumbent)	Telecom Italia (incumbent)	Telekom Slovenije (incumbent)
Operator offers IPvIC with its (fixed and/or mobile network)	Fixed network	Fixed network	Fixed network	Fixed network	Fixed network
The following major technical aspects are further specified in the national specification(s):					
• IC architecture	Not appl.	Yes	Yes	Yes	Not appl.
• Signalling protocol (at PoI)	Not appl.	Yes	Yes	Yes	Not appl.
• Number ranges supported	Not appl.	No	No	Yes	Not appl.
• Supplementary services supported	Not appl.	Yes	Yes	Yes	Not appl.
• Codecs supported	Not appl.	Yes	Yes	Yes	Not appl.
• QoS	Not appl.	Yes, but no QoS objectives	Yes	Yes	Not appl.
• Physical interface	Not appl.	Yes	No	Yes	Not appl.
• Redundancy	Not appl.	Yes	No	Yes	Not appl.
• Security	Not appl.	Yes (high level principles)	No	Yes	Not appl.
• Other major technical aspects (which?)	Not appl.	No	Yes, emergency calls	Yes, emergency calls	Not appl.

Source: BEREC

Ref: 112 and the EU Legislative Framework EENA.

Ref: Case Studies on IP-based Interconnection for Voice Services in the European Union. BEREC

IMS and NG112: Interconnection example



(M)(V)NO routing to National /Regional/Local Point of presence

PSAP DOMAIN

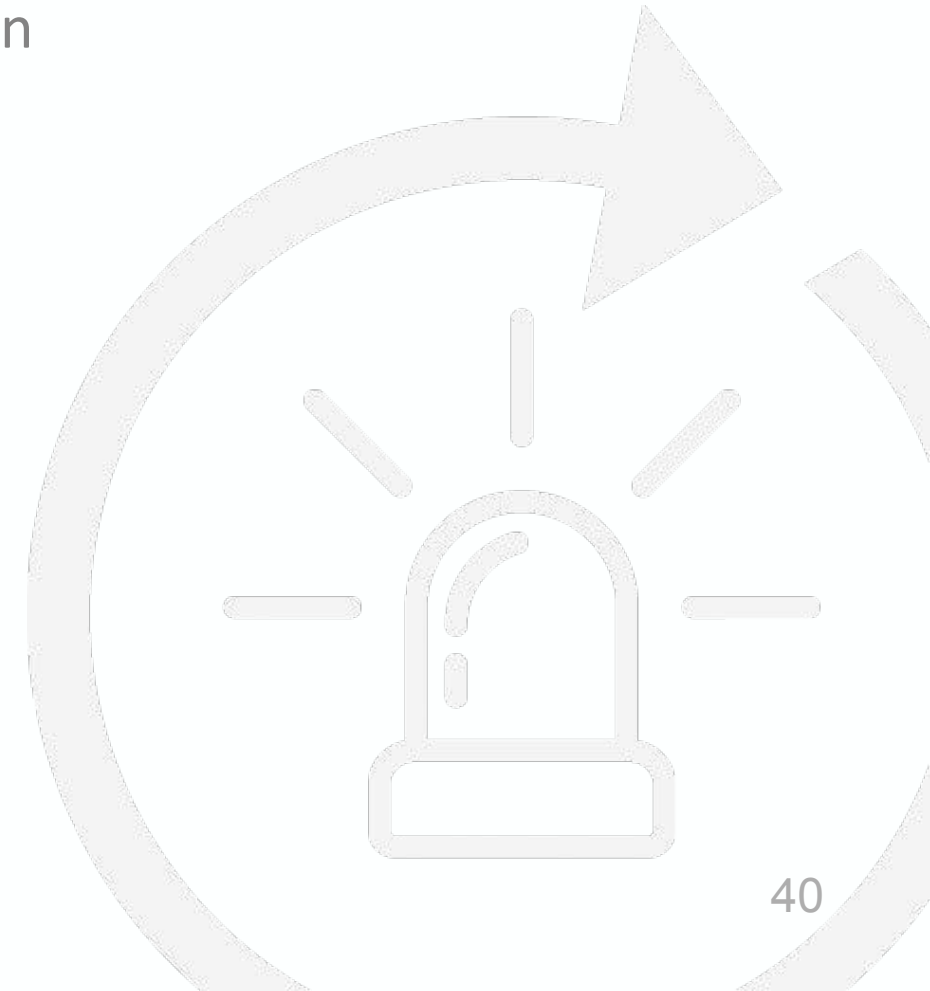
IMS and NG112: Interconnection example

- Tested in 1st and 2nd NG112 plugtests hosted by ETSI in 2016 & 2017
- Le interface not mandatory by 3GPP: **may** use MLP….
  - Eastwound NG112 LIS interface compatible
- VoLTE (IMS) aware BCF
  - SIP sanitizing
    - IMS specific headers
  - Border Controlling
  - B2BUA mode
  - Trans-coding if AMR-WB not supported in the ESINET
  - QoS pre-conditions

IMS and NG112: Interconnection example

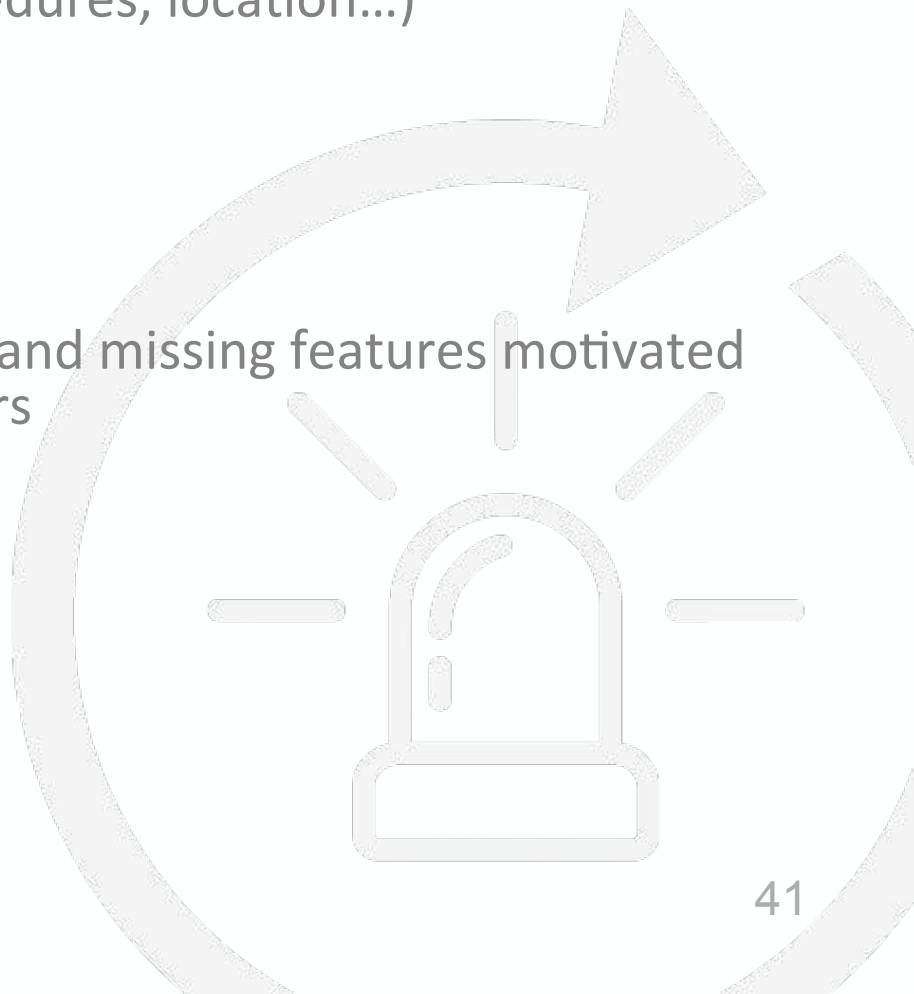
- Location (initial) conveyance
  - From UE or Network assisted using PANI information
- Location update
  - Not considered in the 1st NG112 plugtest
    - SIP presence based mechanism + LIS Subscribe/Notify?
- Messaging
  - MSRP considered in NG112

- ALTERNATIVE:
  - ATIS 0500032



Analysis / Discussion: …will replace?…

- 3GPP specifies its own comprehensive / standalone system for emergency calling
  - Specific support for different access technologies (procedures, location…)
  - If PSAP is IMS user, CSCF can determine the route
    - Otherwise, use a default exit point?
  - Some (old) interoperability with NENA i2
  - Keeps integrating new features
- The lack of widespread adoption of IMS as VoIP technology and missing features motivated the need for i3 architecture and protocols in the last 10 years
  - Any longer?
- Missing features in original (3GPP's):
  - Advanced policy routing
  - Explicit integration of non-IMS technologies
  - Unified location retrieval mechanism (from PSAPs)



Analysis / Discussion: …will complement?...

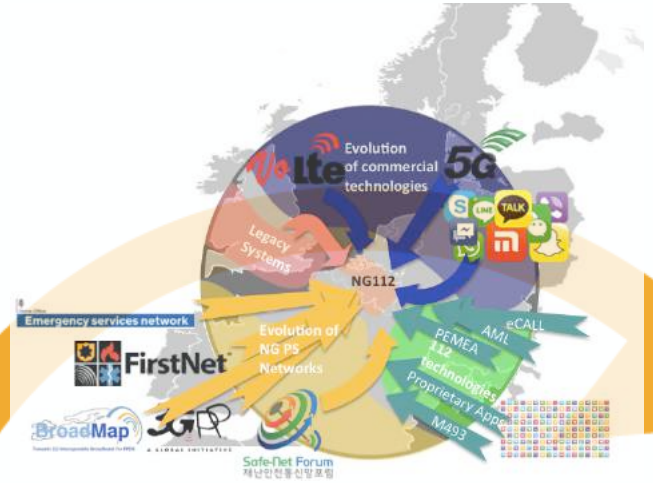
- NG112 LTD
  - ESInet as the core network, with BCF as entry point
  - PSAPs connected to the ESInet (directly or through access networks)
  - IMS as another access network
    - Signalling / media issues?
    - QoS / policy issues?
    - Location: trusted? Access from external PSAP to LRF?

Analysis of new landscape

Will IMS/VxLTE/RCS probably…

- …replace …
  - A complete IMS core would become a prerequisite for ANY originating network
- …complement …
  - commercial operator based routing to single PoP (BCF) and later PSAP-aware routing in the ESINET
- …push …
  - native *NG112* support in every 4G phone ⇔ VxLTE capable ⇔ different penetrations
- …delay …
  - If everything is becoming IMS, should I wait to IMS based NG112? NOTE on ATIS IMS comment (not from a PSAP point of view)

…*NG*112?



CHAPTER 4

SIPconnect 2.0

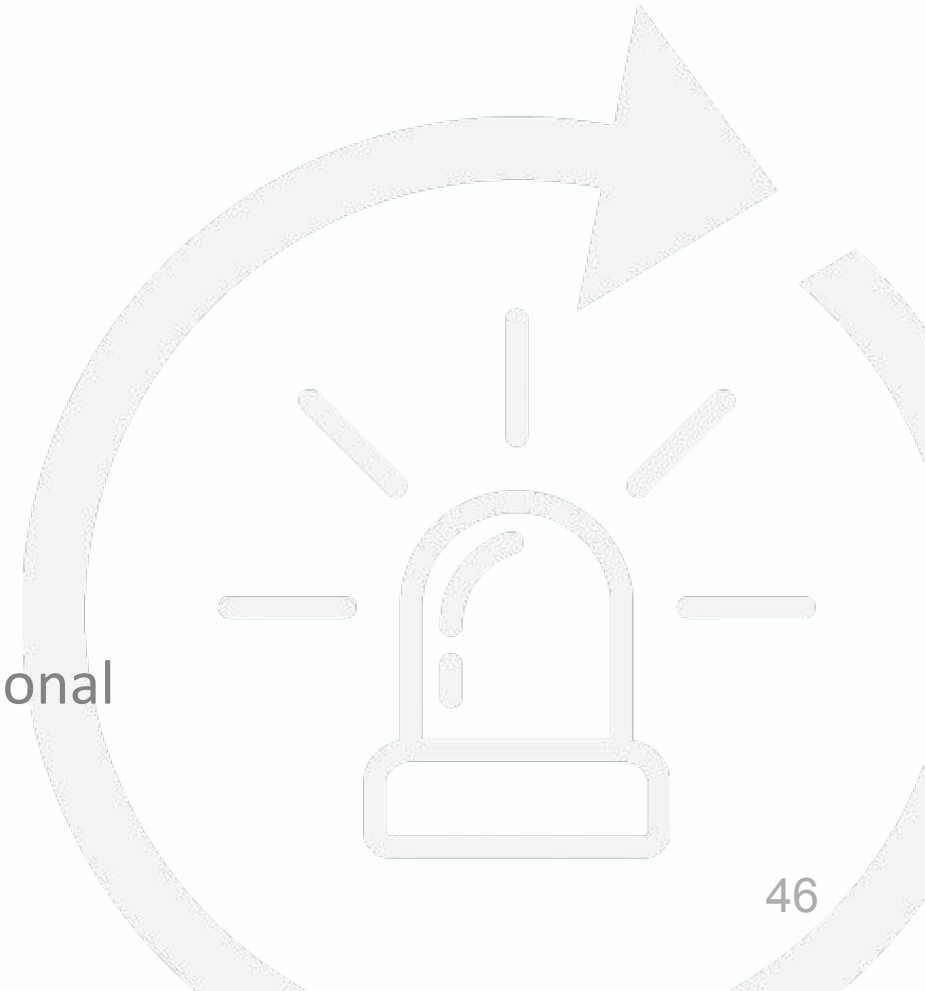
SIPconnect: Main characteristics

- Industry-wide, standards-based approach to direct IP peering between SIP-enabled IP PBXs and VoIP service provider networks
- Driven by VoIP Industry (SIP Forum)
  - Not an SDO but interoperability events (SIPit), compliance tests, best practices..
- Two reference points (Signalling and media)
  - Between Enterprise Network and the Service Provider Network
  - The primary service audio-based call origination and/or termination between the Enterprise and Service Provider Networks, including emergency services. The delivery of any other service (e.g. instant messaging, etc.) is out of scope.
- Emergency aspects
  - Specification 1.1
    - A roadmap on what implementers can expect in subsequent SIPconnect revisions (IPv6, Emergency Services, etc.)
  - Specification 2.0
    - Specification of minimum requirements for emergency calling

Ref: SIP Forum

SIPconnect: Key technologies/protocols

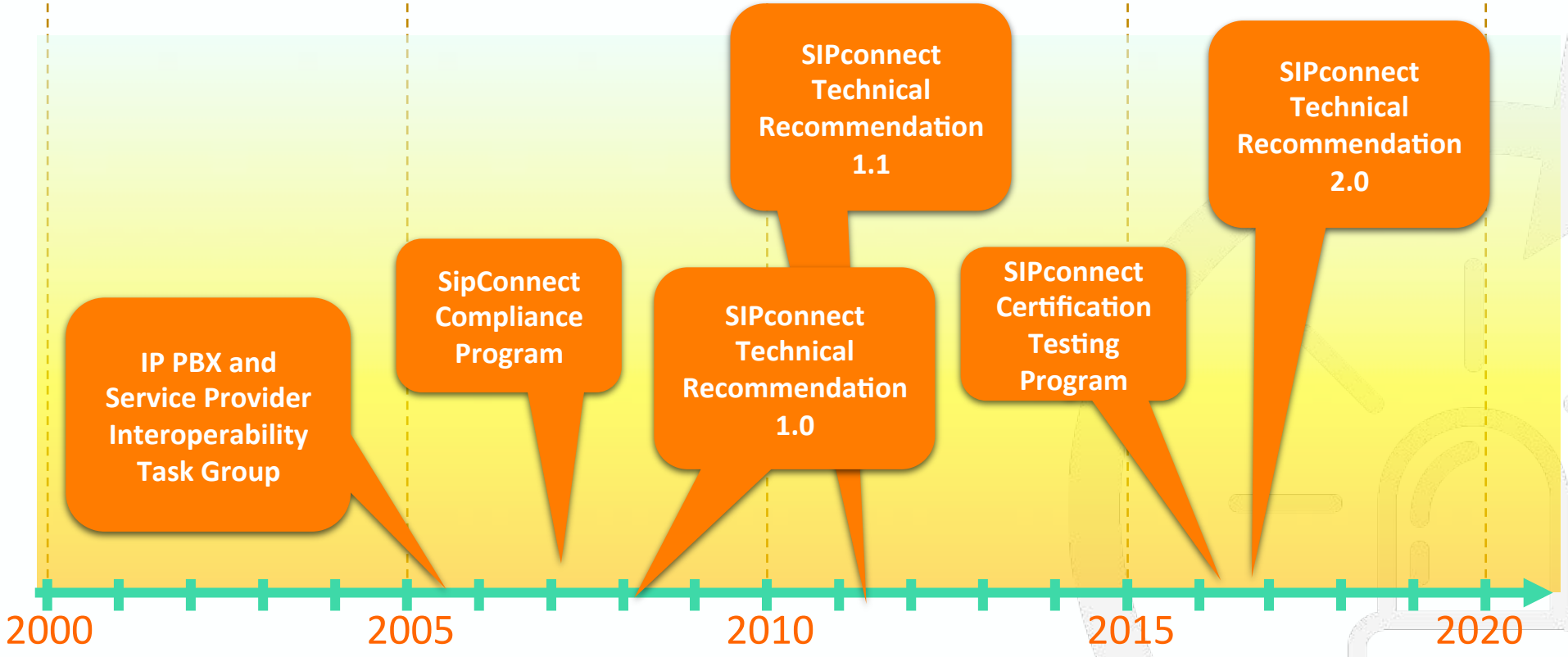
- Signalling:
  - Overall
    - SIP/SDP
      - RFC 3261/RFC 3264 + Specific profile
      - Registration and static modes
      - TLS
      - E.164;user=phone
        - Other identities out of scope
    - (S)RTP
- Media:
  - Codec G.711 PCM (a, u laws) mandatory, G.729 optional



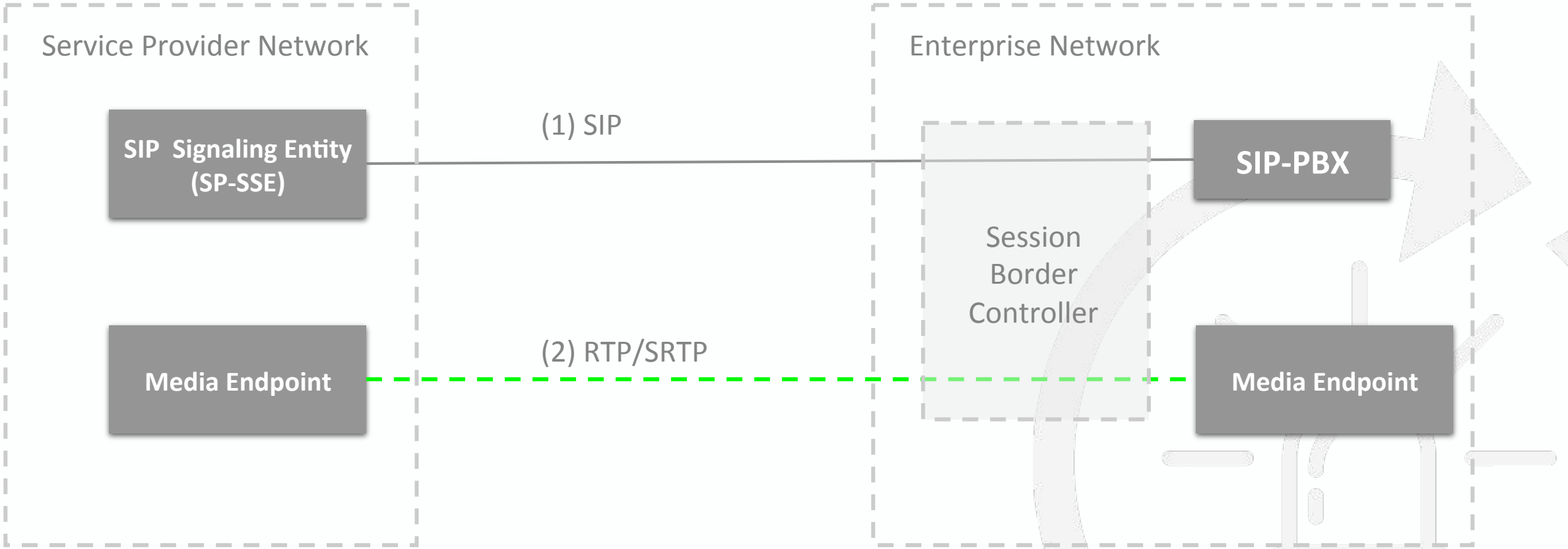
Ref: SIPconnect Technical Specification 2.0

History of SIPconnect

SIP FORUM

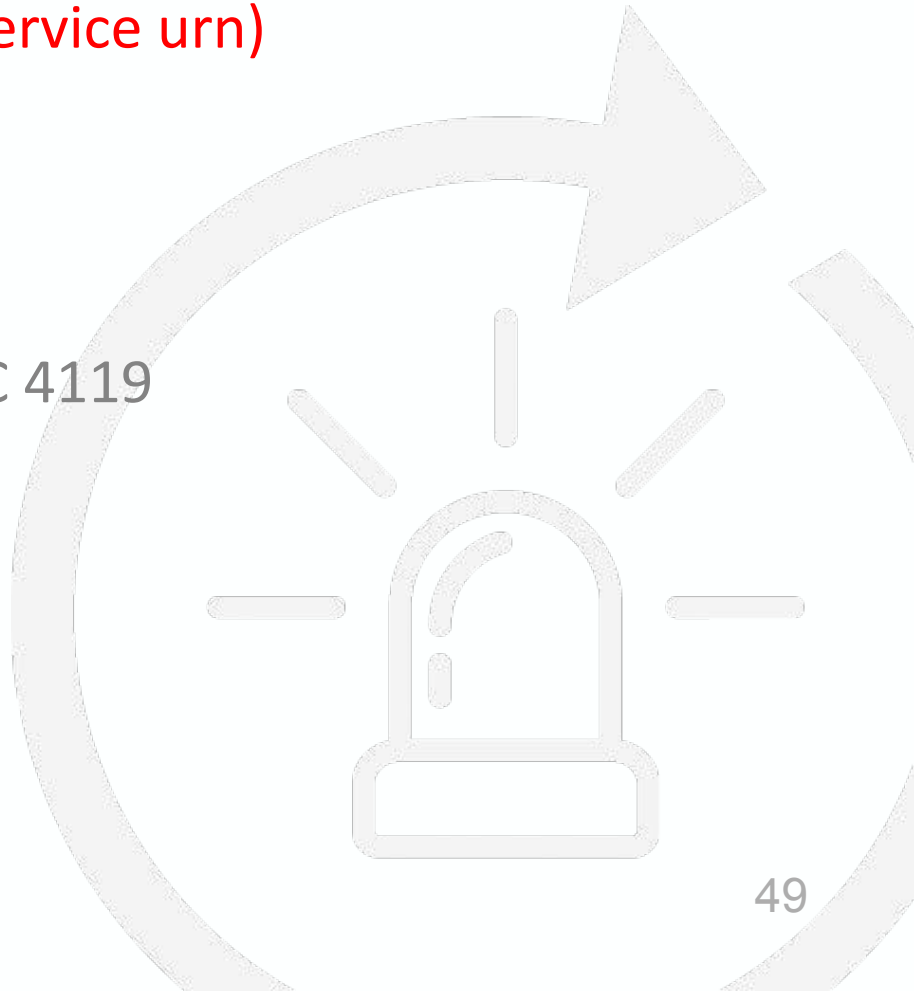


SIPconnect: reference architecture



SIPconnect and emergency calling

- Voice calling “only”
  - R-URI => dial string URI with national number (not service urn)
  - PAI
- Location conveyance
  - MAY/SHOULD (not mandatory)
  - Geolocation Header RFC6442 + pidf-lo RFC5491, RFC 4119
- SIP Forum 3.0
  - STIR/SHAKEN trustworthy ID



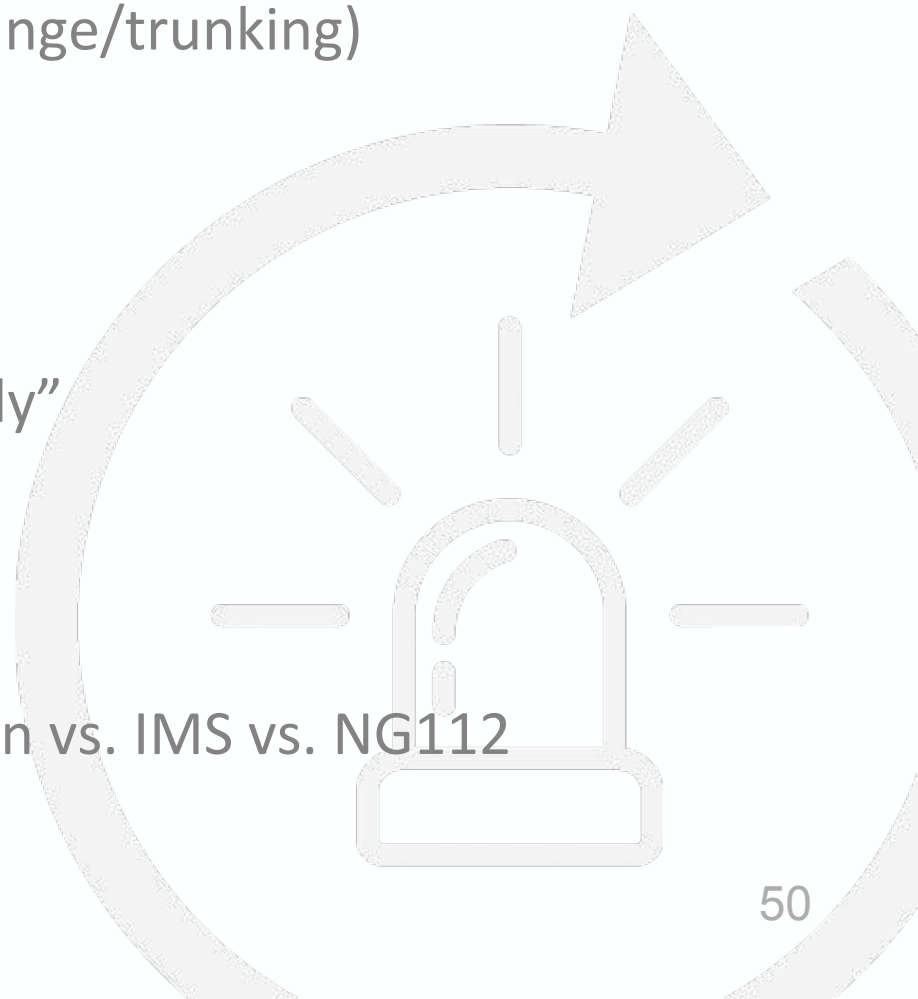
Analysis of new landscape

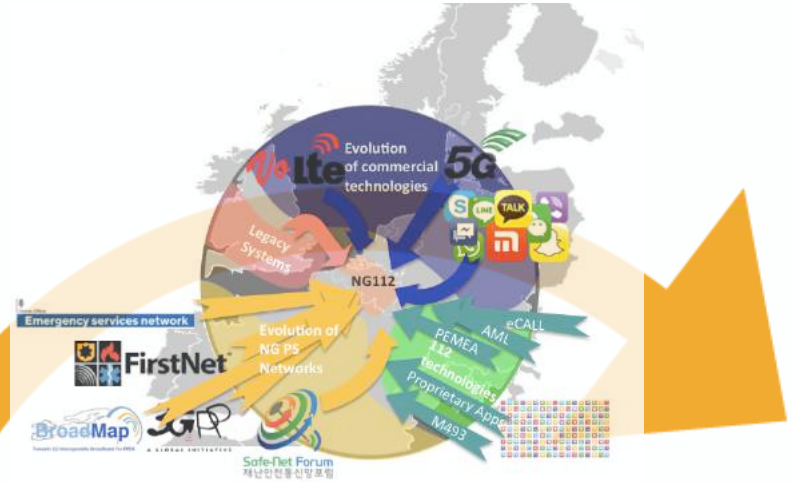
Will SIPconnect…

- …replace …
  - Not likely: very specific reference points (SIP exchange/trunking)
- …complement …
  - NA

- …push …
  - Not likely. Originating enterprise SIP networks “only”
  - Reference points not fully aligned
    - +112 instead os sos service urn
- …delay …
  - Will depend of the evolution of SIPconnect adoption vs. IMS vs. NG112

…NG112?





CHAPTER 5

M/493

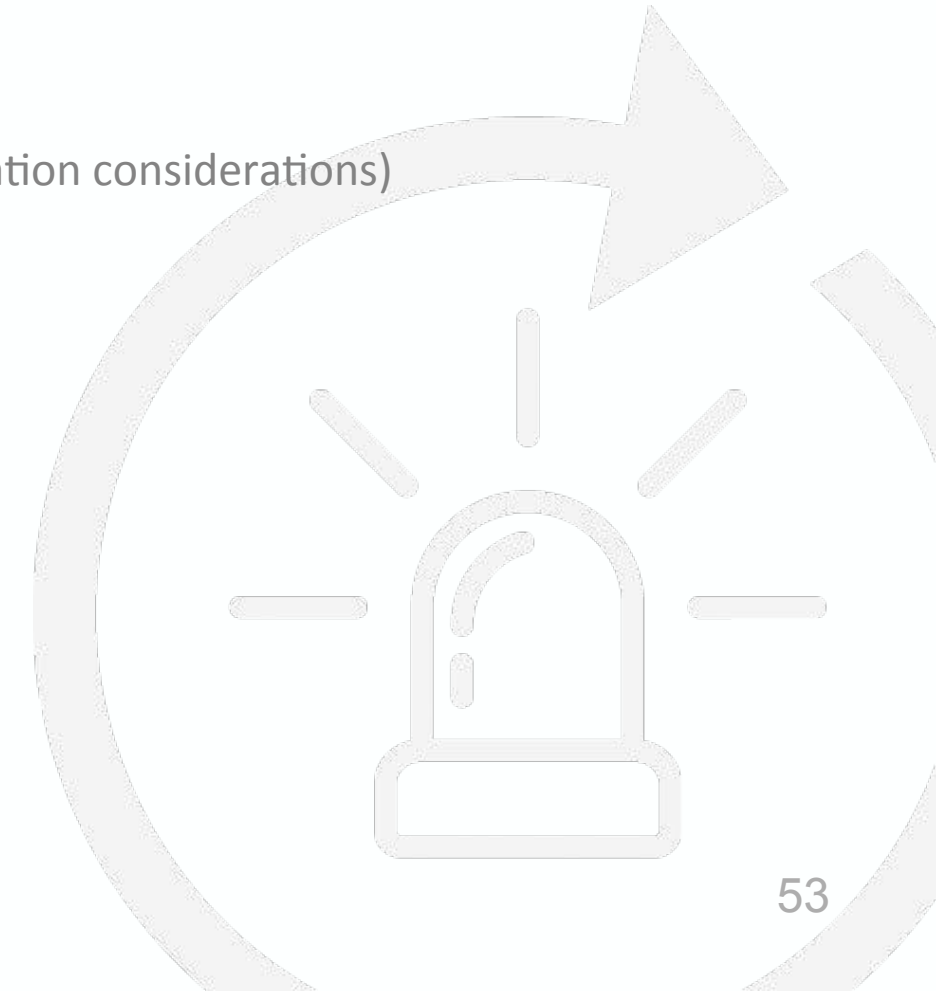
M/493: Main characteristics

- Location determination and transport
- Driven by EC demands
  - “The determination and transport of caller location information for VoIP needs to be fully standardised”
    - single functional model + the necessary interfaces and protocols.
  - The enhancement, i.e. location data provision may be delivered by means of traditional or new methods
  - This work shall not be focused on NGN but shall address current implementations for all types of voice calls (fixed, mobile, static and nomadic VoIP) in EU countries.
- Two mechanisms
  - Push/Pull

Ref: EC M/493
Ref: ETSI ES 203178

M/493: Key technologies/protocols

- Signalling:
  - Overall
    - SIP/RTP
      - Specific reference to “IMS compatibility” (AKA implementation considerations)
  - Location querying/retrieval/update
    - HELD or MLP

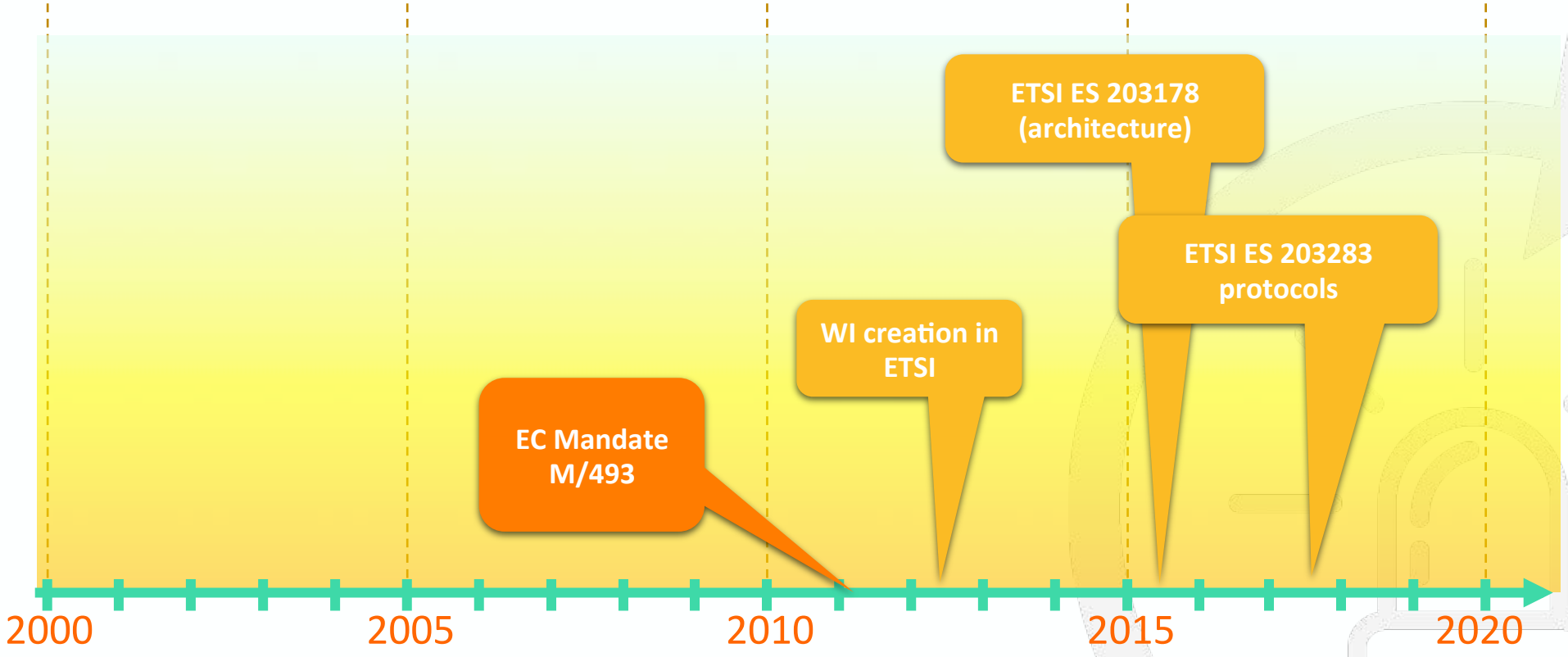


Ref: ETSI ES 203283

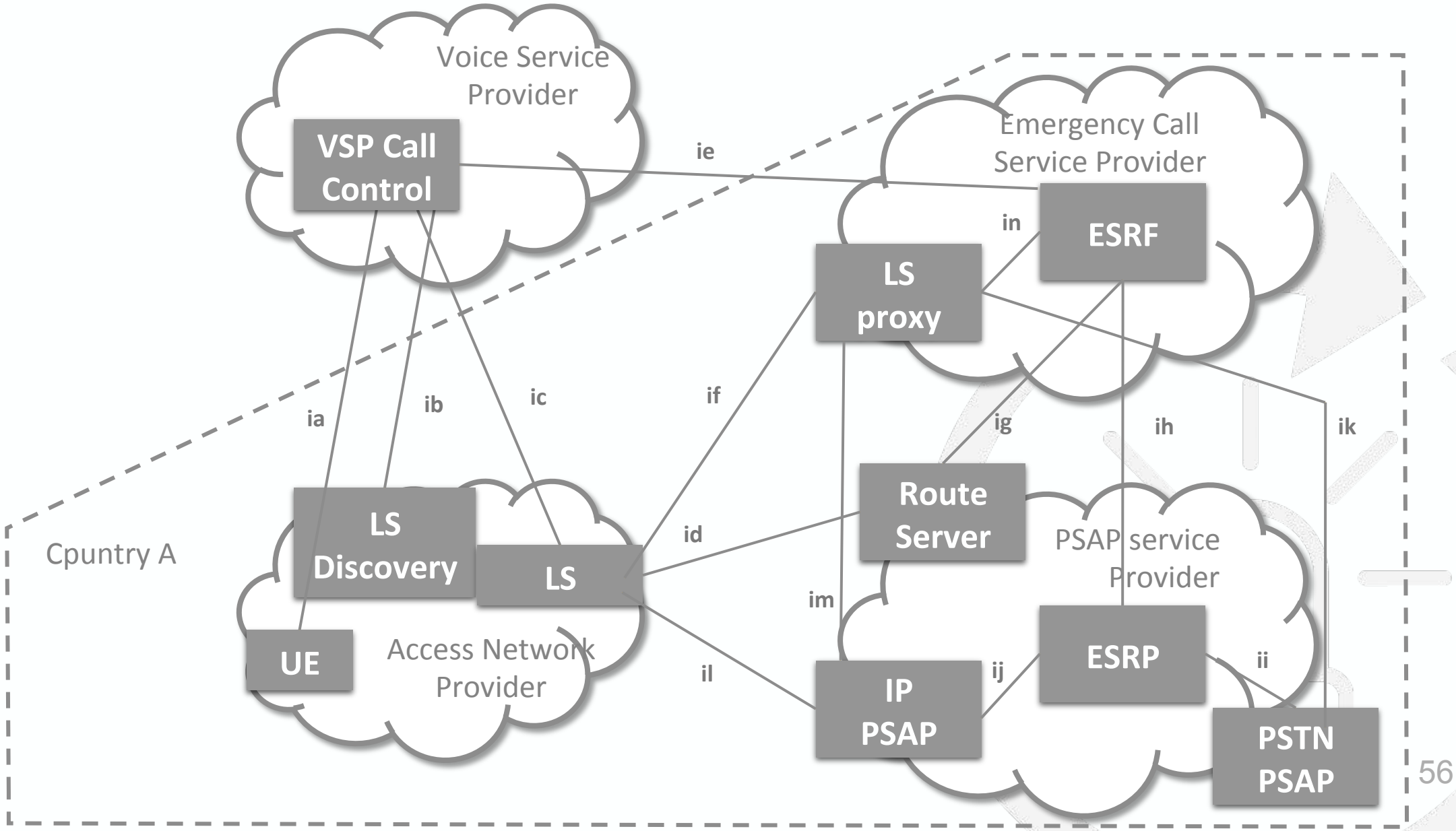
M/493: an alternative NG112 architecture?

- Originally location determination
  - +Call routing/PSAP determination?
  - Ia interface out of scope (any VoIP technology)
- Common interfaces
  - “The interfaces ia, ib, ic and ie are external, which means between country A and anywhere and (with the exception of ia) are specified in detail to ensure that all VSPs and VAPs can participate in the processes for emergency service caller location determination and transport based on the architecture of ETSI ES 203 178 [1] within country A.”
- National domain (framework)
  - “The interfaces id, if, ig, ih, ii, ij, ik, il, im and in are internal, inside country A, and should be specified considering the existing national implementations and regulations in country A. When other protocols are used care is to be taken that all information elements outlined in the architecture are covered.”

History of M/493

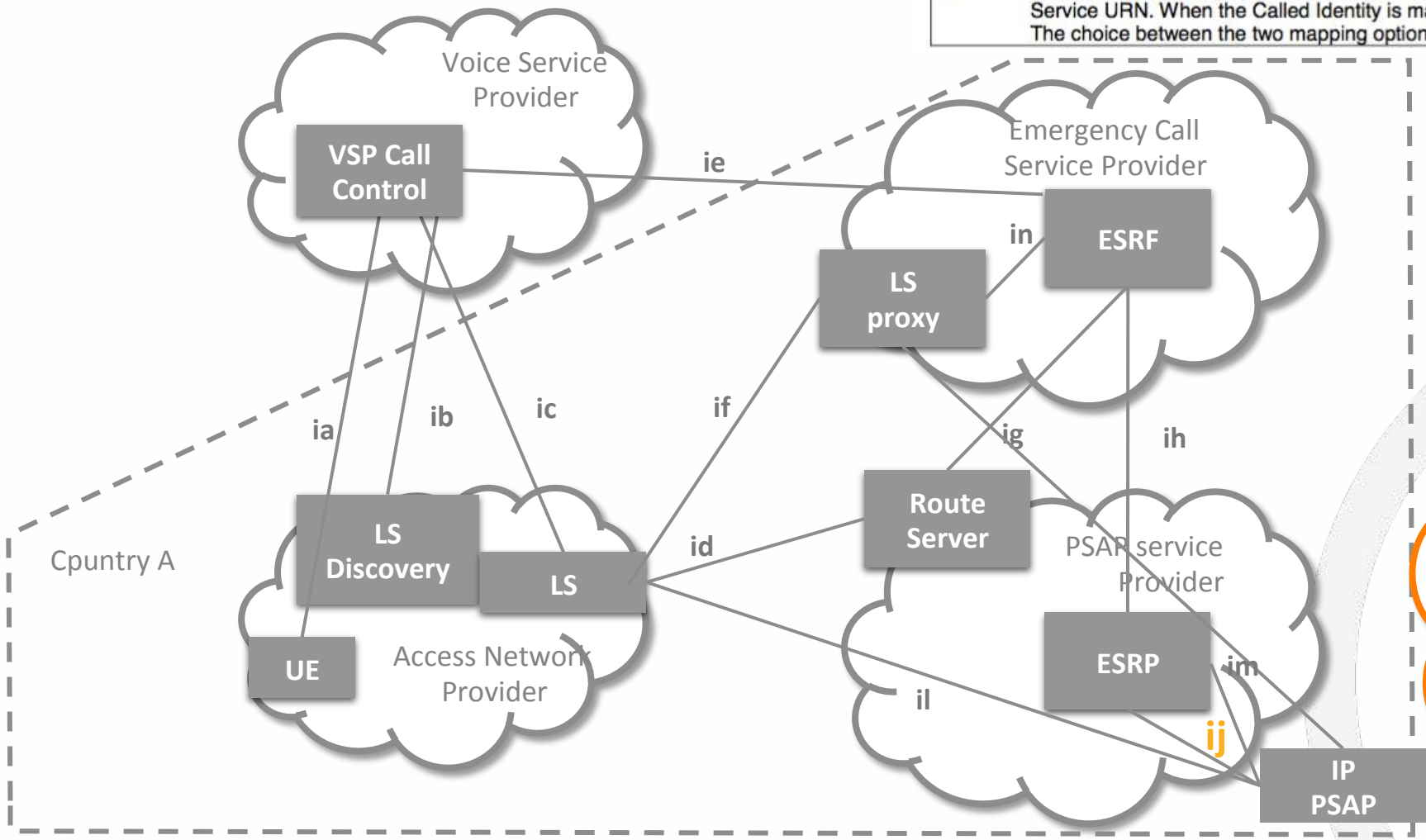


M/493: Architecture

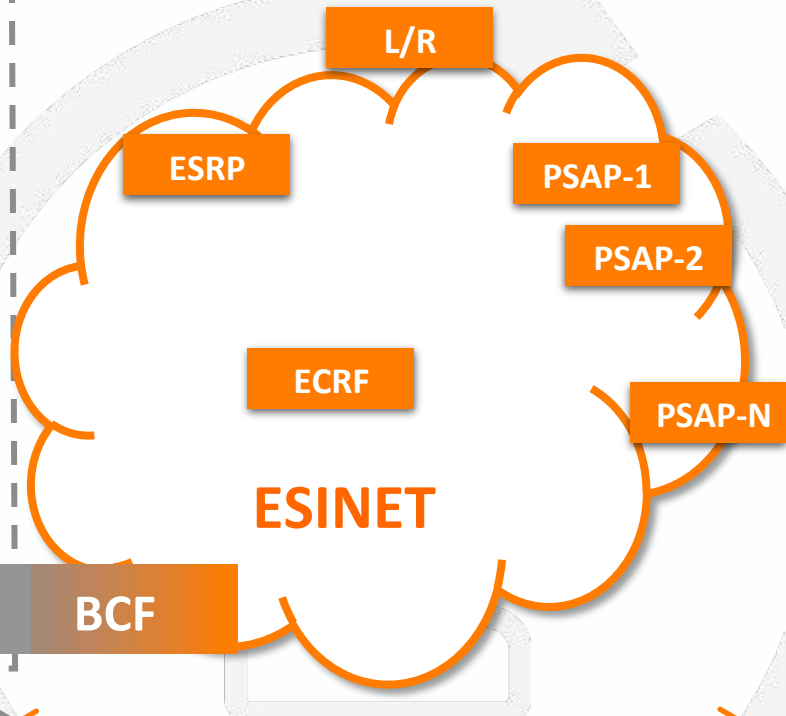


M/493 and NG112 interconnection example

NOTE: When the Called Identity is mapped to the Route header field, the Request URI shall contain the original Service URN. When the Called Identity is mapped to the Request URI it shall contain a SIP URI or a telURI. The choice between the two mapping options is a national matter within country A.



ij: interface "compatible" service urn in R-URI ⇔ national matter



M/493 resulting location & routing to National Point of presence

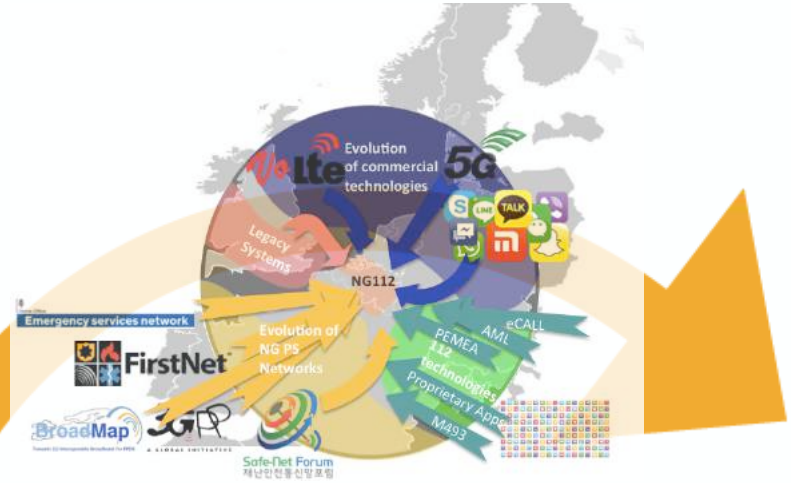
PSAP DOMAIN

Analysis of new landscape

Will M/493…

- …replace …
  - Not likely: it focus on originating networks and national details
- …complement …
  - commercial operator based routing to single PoP (BCF) and later PSAP-aware routing in the ESINET
  - Comprehensive analysis of the mapping between architectures should be carried out
- …push …
  - If resulting architecture from M/493 is transposed to some European directive => harmonization is always good NOTE: national matter specifically mentioned
- …delay …
  - Maybe, due to the “possible” uncertainty on resulting harmonization, need for cooperation from Access Network providers

…NG112?



CHAPTER 6

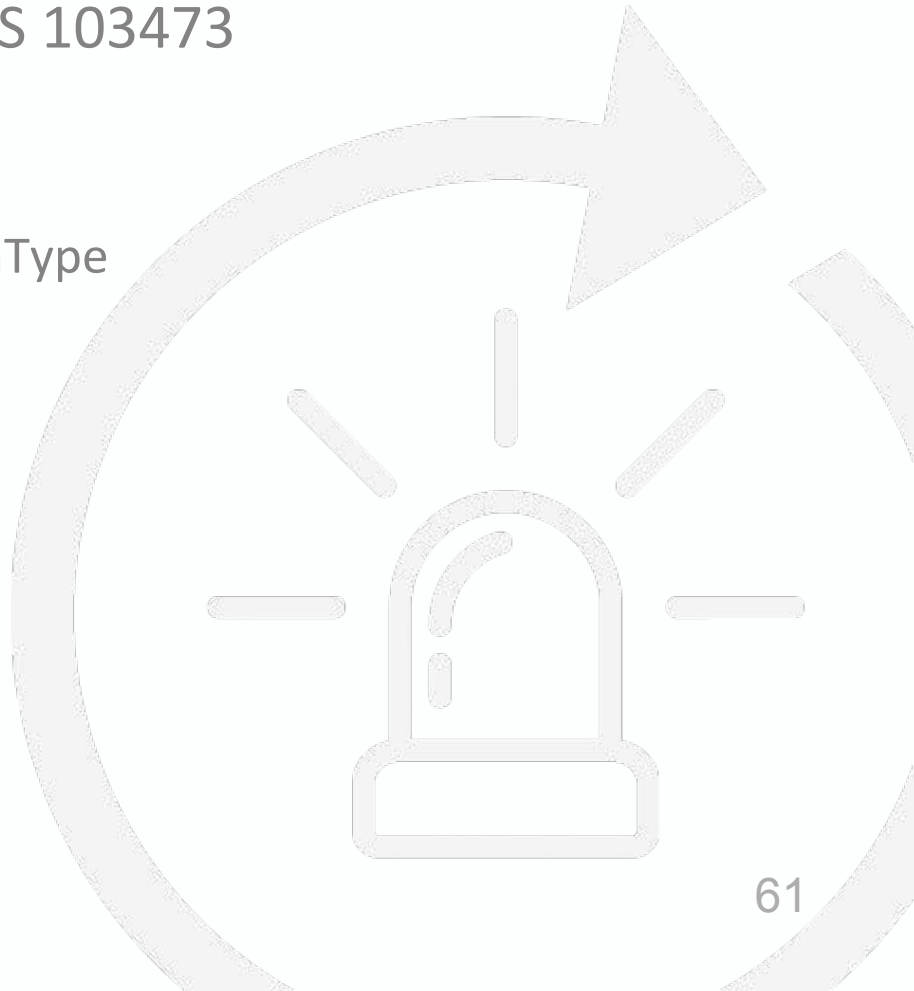
PEMEA

PEMEA: Main characteristics

- Allow localized mobile apps to roam across Europe
- Driven by (NG) 112 apps developers in EENA
- Data exchange and security model
  - + Location
- Calling?
  - PEMEA was intended to provide a stepping stone to the Core element for network independent access to emergency services TS 103 479 NOTE: NG112
    - by reusing many of the same data structure used in the IETF and 3GPP specifications as well as TS 103 479.
    - Clauses 8.2 and 8.3 provide descriptions for a call is SIP-based and traverses the Border Control Function (BCF) to enter the ESInet, and the legacy case where the call enters the ESInet via a legacy network gateway (LNG). The information contained in these clauses is informative only.

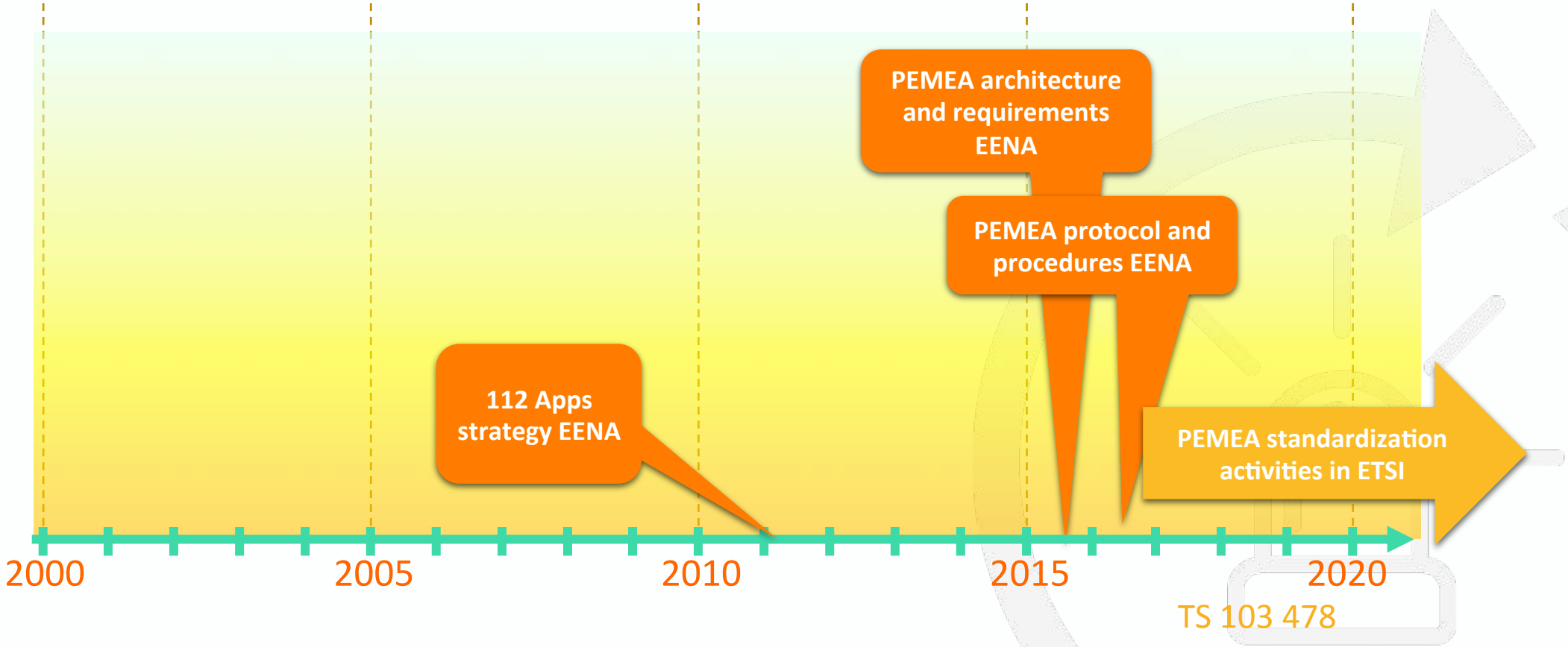
PEMEA: Key technologies/protocols

- Signalling:
  - Not specific for Voice Calling NOTE alignment with TS 103473
  - Data exchange using XML over secure HTTP
    - registry
    - Location querying/retrieval/update => pemea:informationType
      - HELD or MLP
  - Pp out of scope (PSAP to PSP) => could be NG112
- Media:
  - Codec/etc:
    - Not mandatory

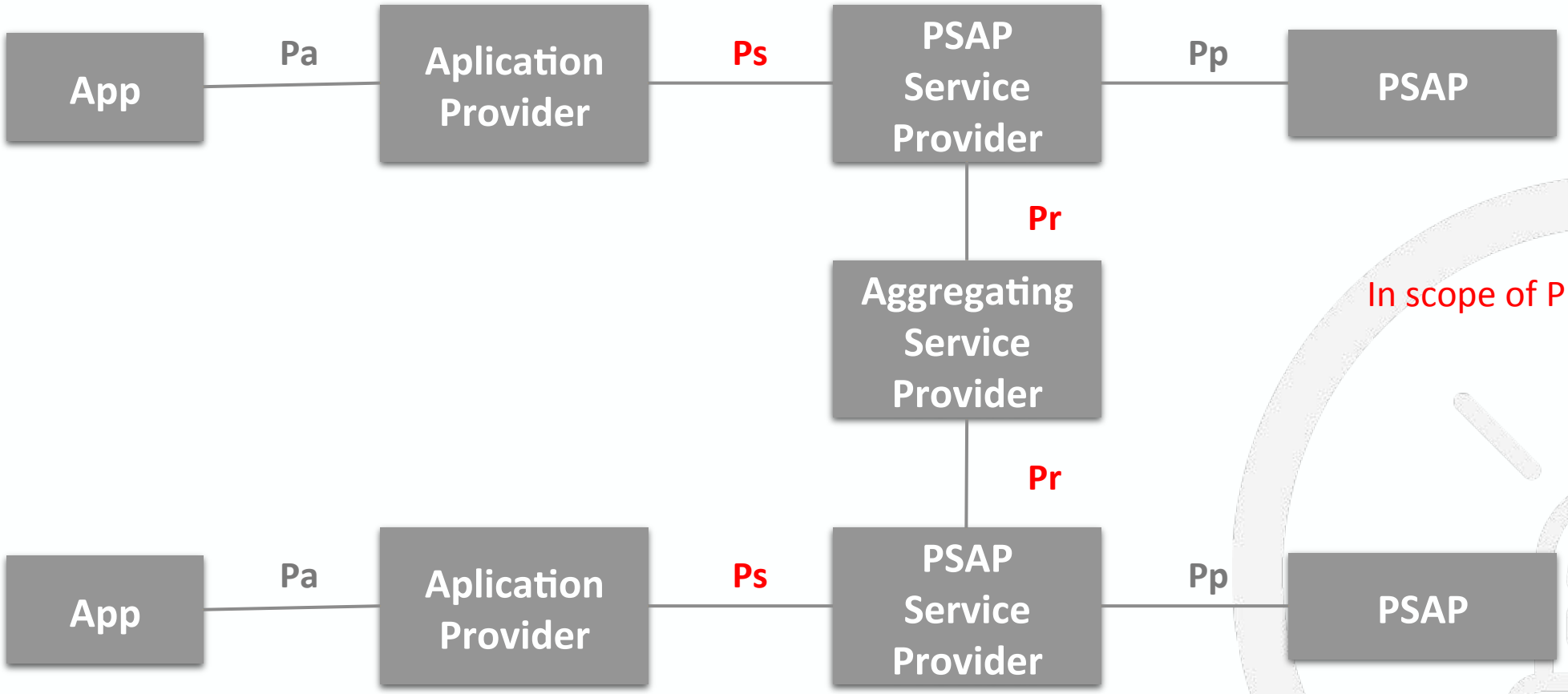


Ref: ETSI draft TS 103 478 v.0.0.6

History of PEMEA



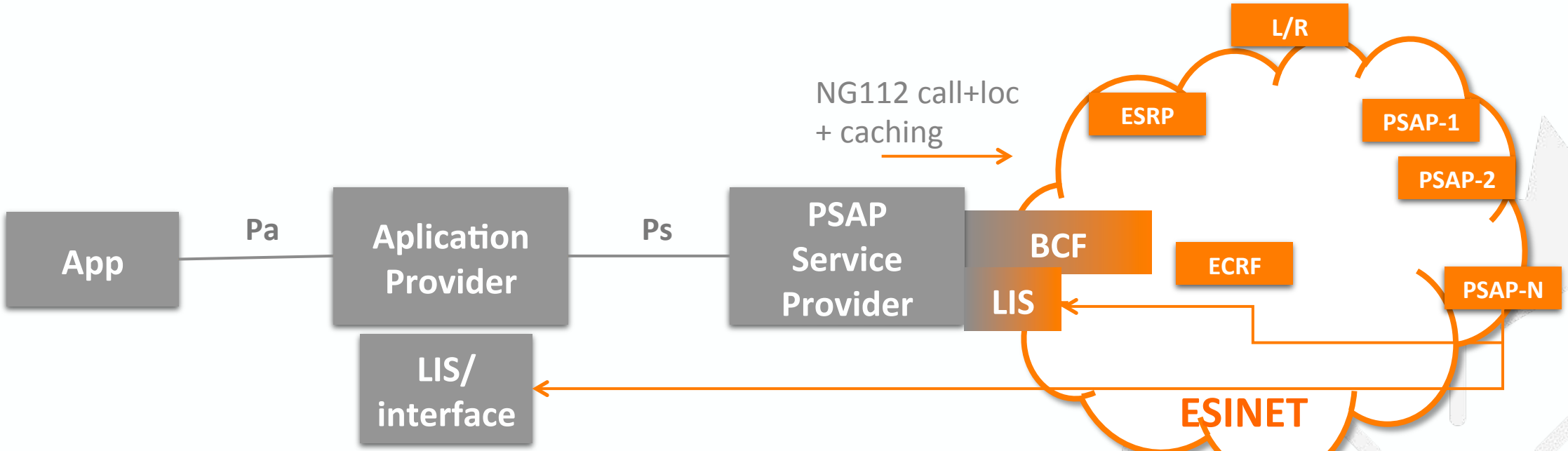
PEMEA: Architecture



In scope of PEMEA

Ref: PEMEA in a nutshell EENA conference 2017

PEMEA and NG112 interconnection example



PEMEA NG112 interworking for emergency calling
Location retrieval tested in 2nd NG112 Plugtest

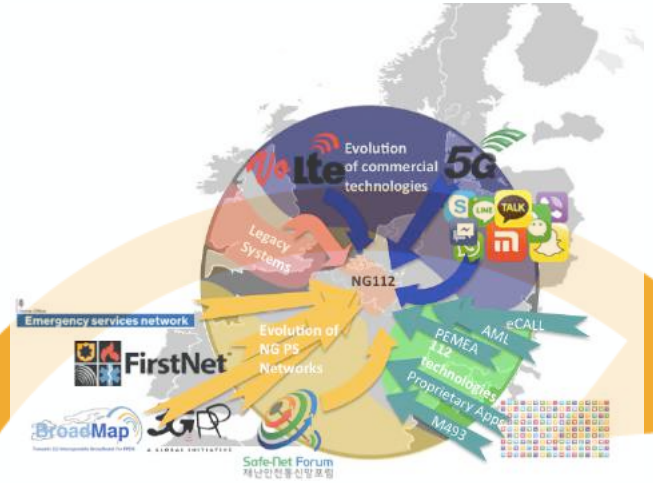
Analysis of new landscape

Will PEMEA…

- …replace …
  - Not likely: targeting data exchange for apps, calling capabilities open
- …complement …
  - Yes: both as “enhanced info additional channel” and interconnection mechanism for apps “originating networks”
- …push …
  - Will depend on NG112’s and PSAPs’ evolution rather than on PEMEA

- …delay …
  - NA

…NG112?

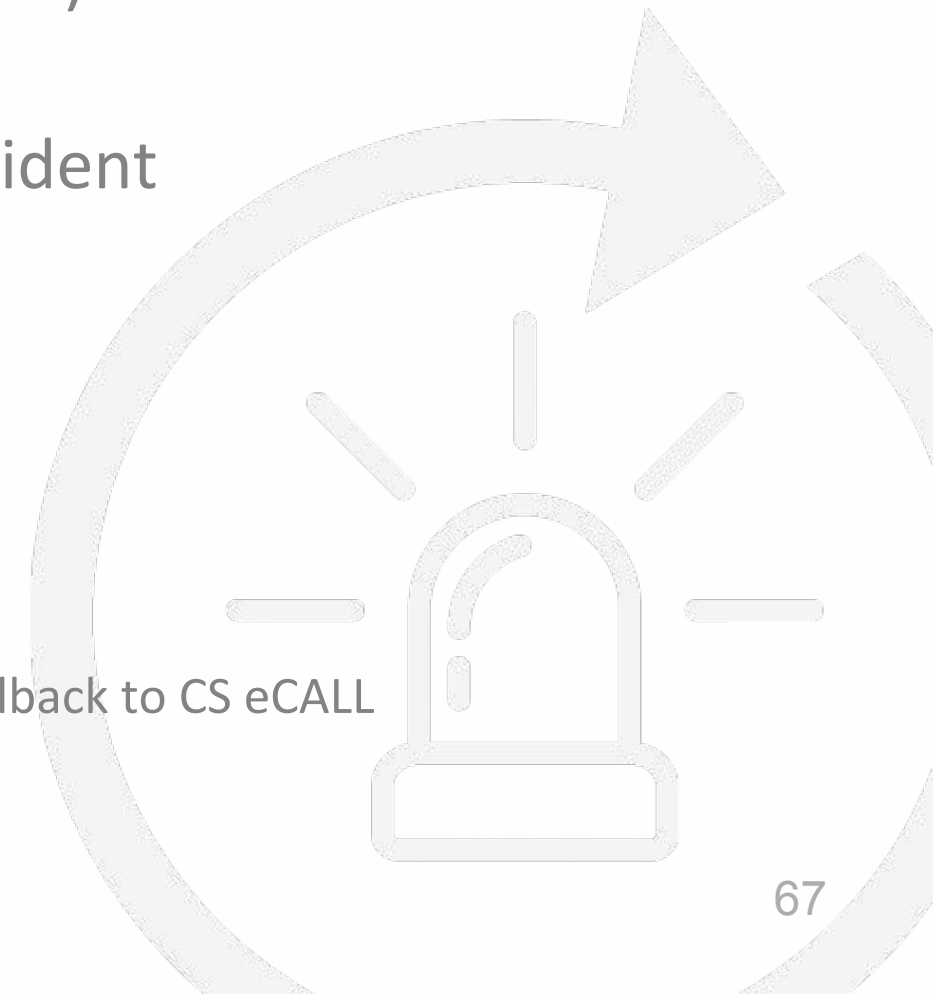


CHAPTER 7

(NG) eCALL

(NG) eCALL: Main characteristics

- Driven by EC, cars manufacturers (ERTICO, ACEA)
  - “Supported” by EENA
- Set up voice call + send MSD in the case of accident
- Mandatory for new cars from March 2018
- NG eCALL
  - Based on IMS
  - Transition from CS to NG ecall
    - All NG eCALL cars must support CS eCALL
    - 1st try NG eCALL (based on support indicator) and/or fallback to CS eCALL



eCALL: Key technologies/protocols

- Traditional:
  - Signalling:
    - In Band MSD

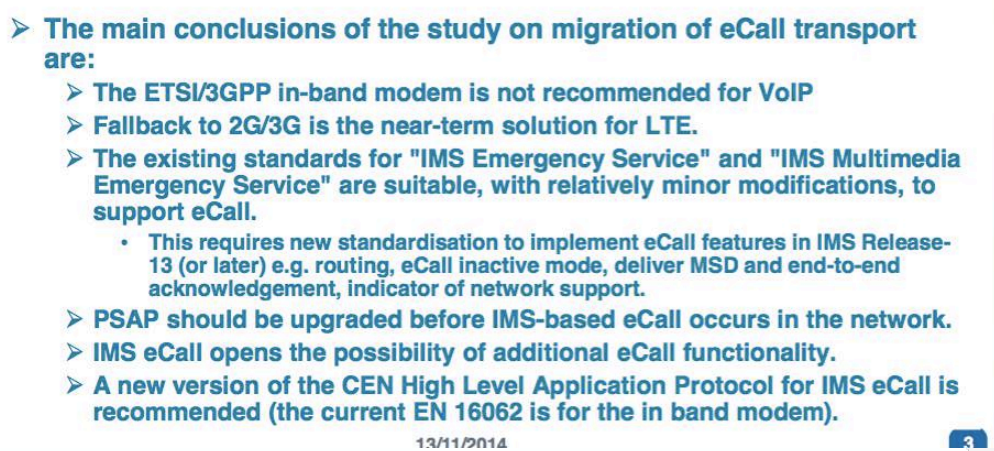
Committee	Reference, Title	Status
CEN/TC 278	**CEN/TS 16405:2017** (WI=00278350) Intelligent transport systems - Ecall - Additional data concept specification for heavy goods vehicles	Published
CEN/TC 278	**CEN/TS 17148:2018** (WI=00278400) Intelligent Transport Systems - eSafety - ProForma eCall Agreement between TPSP and PARES	Approved
CEN/TC 278	**EN 15722:2015** (WI=00278376) Intelligent transport systems - ESafety - ECall minimum set of data	Published
CEN/TC 278	**EN 16062:2015** (WI=00278378) Intelligent transport systems - ESafety - eCall high level application requirements (HLAP) using GSM/UMTS circuit switched networks	Published
CEN/TC 278	**EN 16072:2015** (WI=00278375) Intelligent transport systems - ESafety - Pan-European eCall operating requirements	Published
CEN/TC 278	**EN 16102:2011** (WI=00278244) Intelligent transport systems - eCall - Operating requirements for third party support	
CEN/TC 278	**EN 16454:2015** (WI=00278349) Intelligent transport systems - ESafety - ECall end to end conformance testing	Published
CEN/TC 278	**FprCEN/TR 17249** (WI=00278466) Intelligent transport systems - eSafety - Extending eCall to other categories of vehicle	Under Approval
CEN/TC 278	**FprCEN/TS** (WI=00278476) Intelligent transport systems - eSafety - eCall via satellite	Under Drafting
CEN/TC 278	**FprCEN/TS -6** (WI=00278471)	Under Drafting

- (NG) eCALL
  - IMS emergency signalling

Ref:CEN, ETSI

(NG) eCALL: Main characteristics

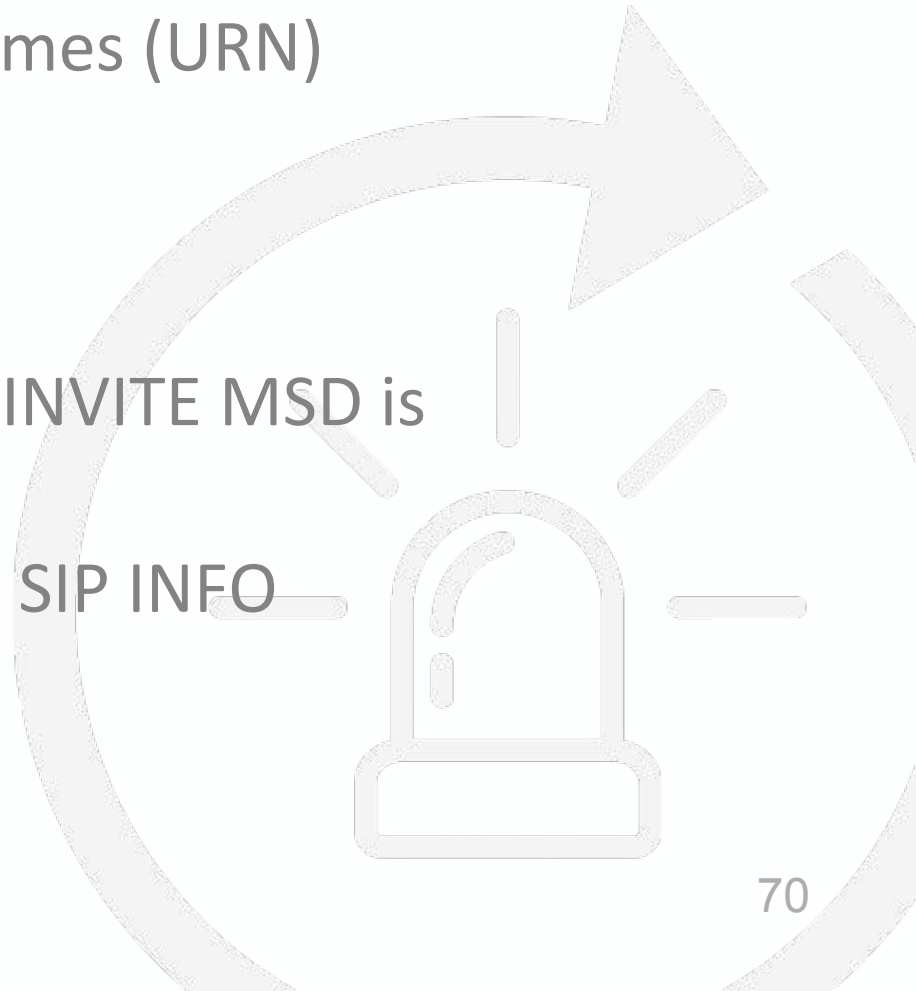
- ETSI TR 103 140
  - STF456
    - Why we do it:
      - eCall is being deployed on 2G and 3G networks but these will not last forever. Already there are 4G networks, and cooperative ITS is on the horizon.
    - How we do it:
      - We are making proposals to 3GPP to show how eCall could be specified for 4G. We are considering how eCall would migrate to 4G and ITS, and in this respect we make presentations to as many eCall stakeholder organisations as possible (e.g. EeIP, HeERO, CEN TC 278, ETSI TC ITS, ISO TC204) to get their views.
- RATIONALE
  - In band eCALL not long lasting solution when compared with cars lifetime



Ref: ETSI STF456 report

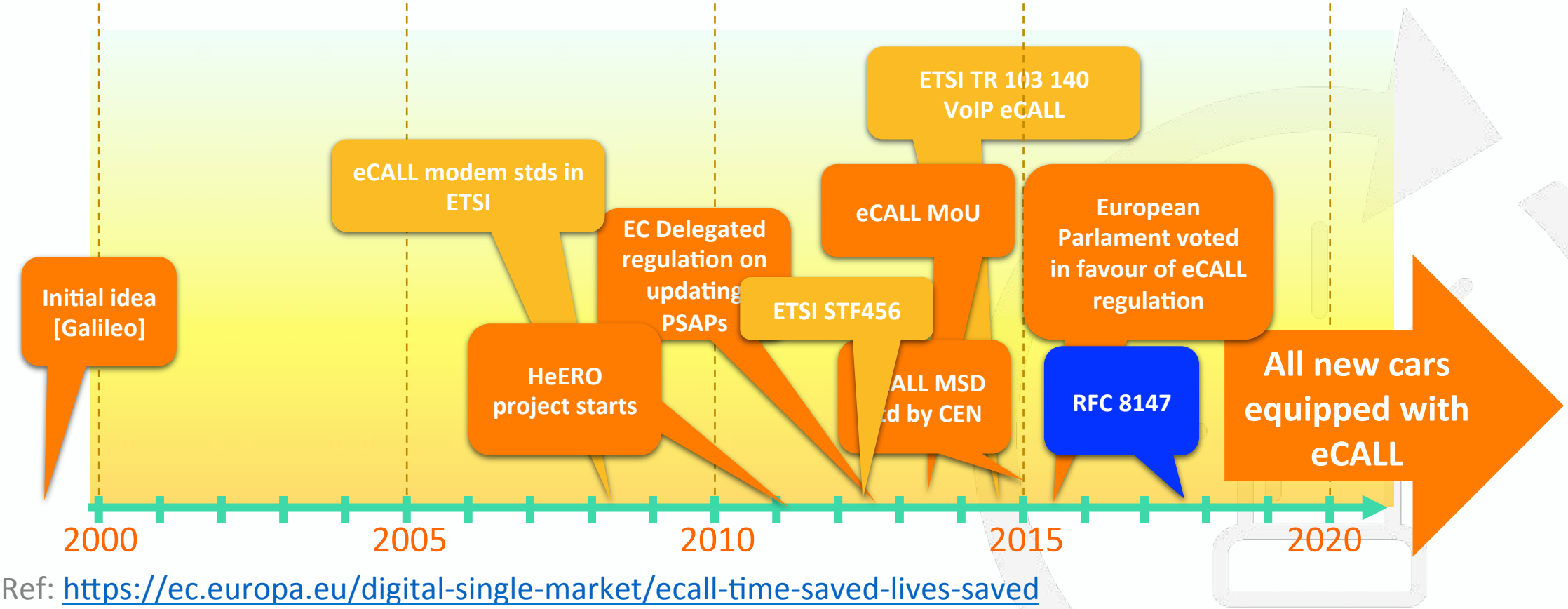
(NG) eCALL: Key technologies/protocols

- Based on IMS emergency call
- Routing to PSAP based on Uniform Resource Names (URN)
  - urn:service:sos.ecall.manual for manual eCall
  - urn:service:sos.ecall.automatic for automatic eCall
  - urn:service:test.sos.ecall for test eCall
- Initial Minimum Set of Data (MSD) is sent in SIP INVITE MSD is acknowledged in the INVITE response
- A new MSD can be requested by the PSAP using SIP INFO



Ref: David William Qualcoomm
Ref: RFC8147

History of (NG) eCALL

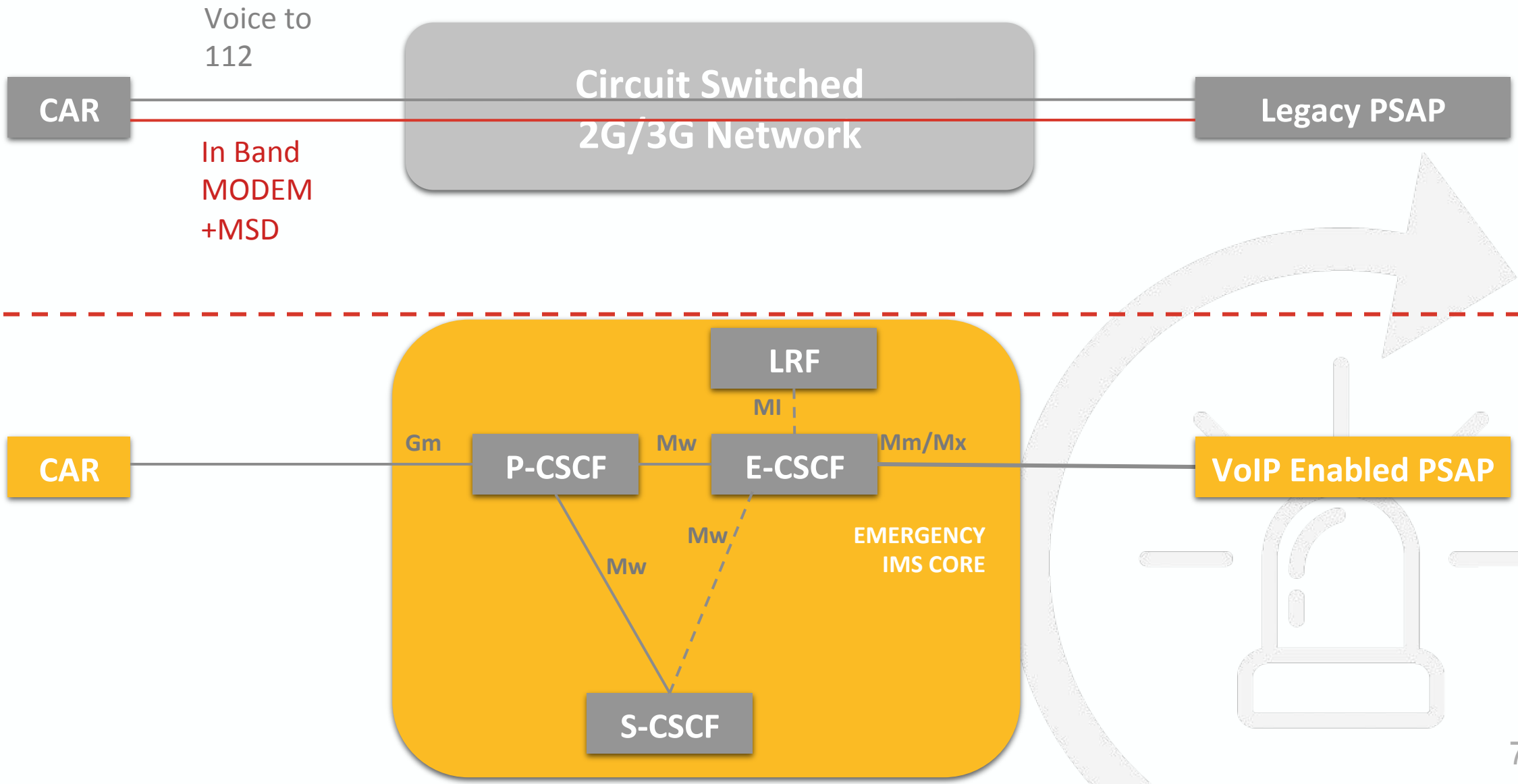


Ref: https://ec.europa.eu/digital-single-market/ecall-time-saved-lives-saved

Ref: eCALL Factsheet EENA

Ref: HeERO project

(NG)eCALL: Architecture

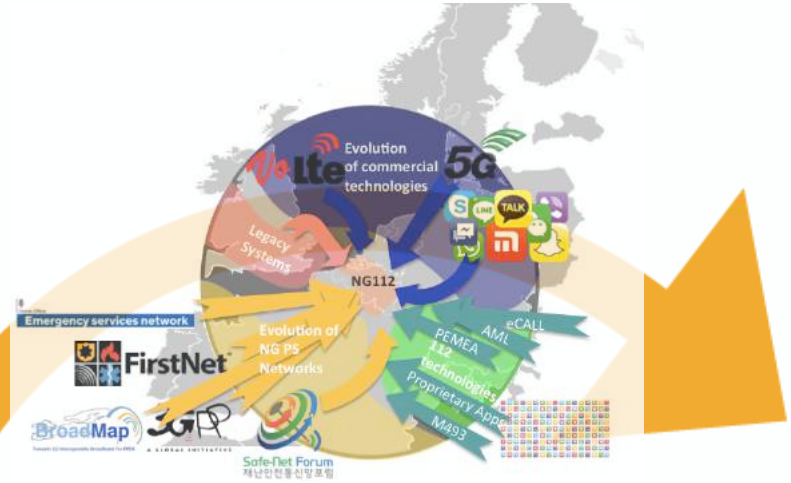


Analysis of new landscape

Will (NG) eCALL…

- …replace …
  - Not likely: Specific niche technology, may push IMS emergency calling
- …complement …
  - commercial operator based routing to single PoP (BCF) and later PSAP-aware routing in the ESINET
- …push …
  - eCALL directive pushing evolution to IP capable PSAPs
  - Good example of EC moving from MoU to legislation
  - Support of sos urn but native IMS “transport” mechanism
- …delay …
  - Not likely: Specific niche technology

…NG112?

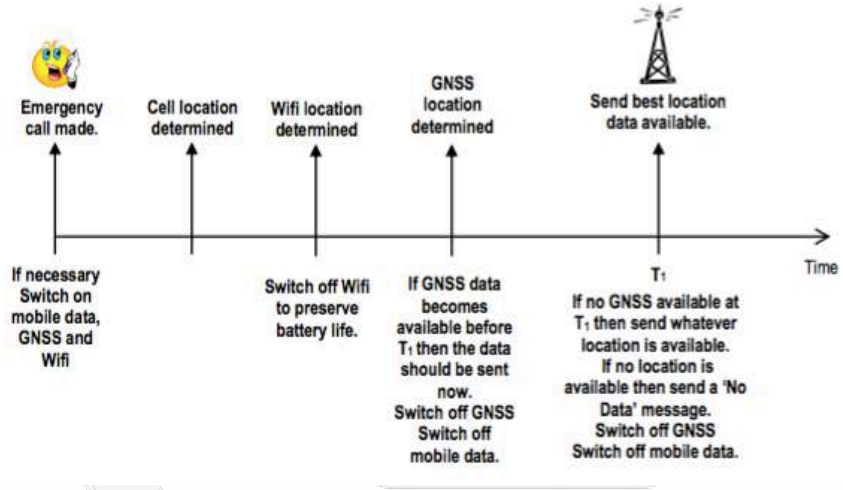


CHAPTER 8

AML

AML: Main characteristics

- Driven by initial initiative of BT (EE,O2, & HTC) in UK, greatly pushed by Google (Android), supported by EENA and later extended to other countries.
- Standardization efforts initiated (EMTEL / ETSI)
  - ETSI TR 103 393
- Automated location conveyance when a emergency call is initiated
  - Silent activation of different location methods+
  - “Out of band” SMS/HTTPs PUSH based signalling



Source: BT

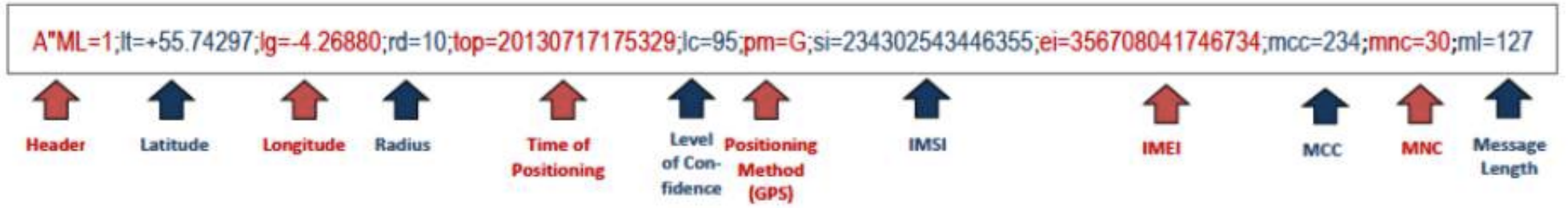
Ref: EENA’s work on AML

Ref: ADVANCED MOBILE LOCATION (AML) IN THE UK, EENA

Ref: AML FAQ, EENA

AML: Key technologies/protocols

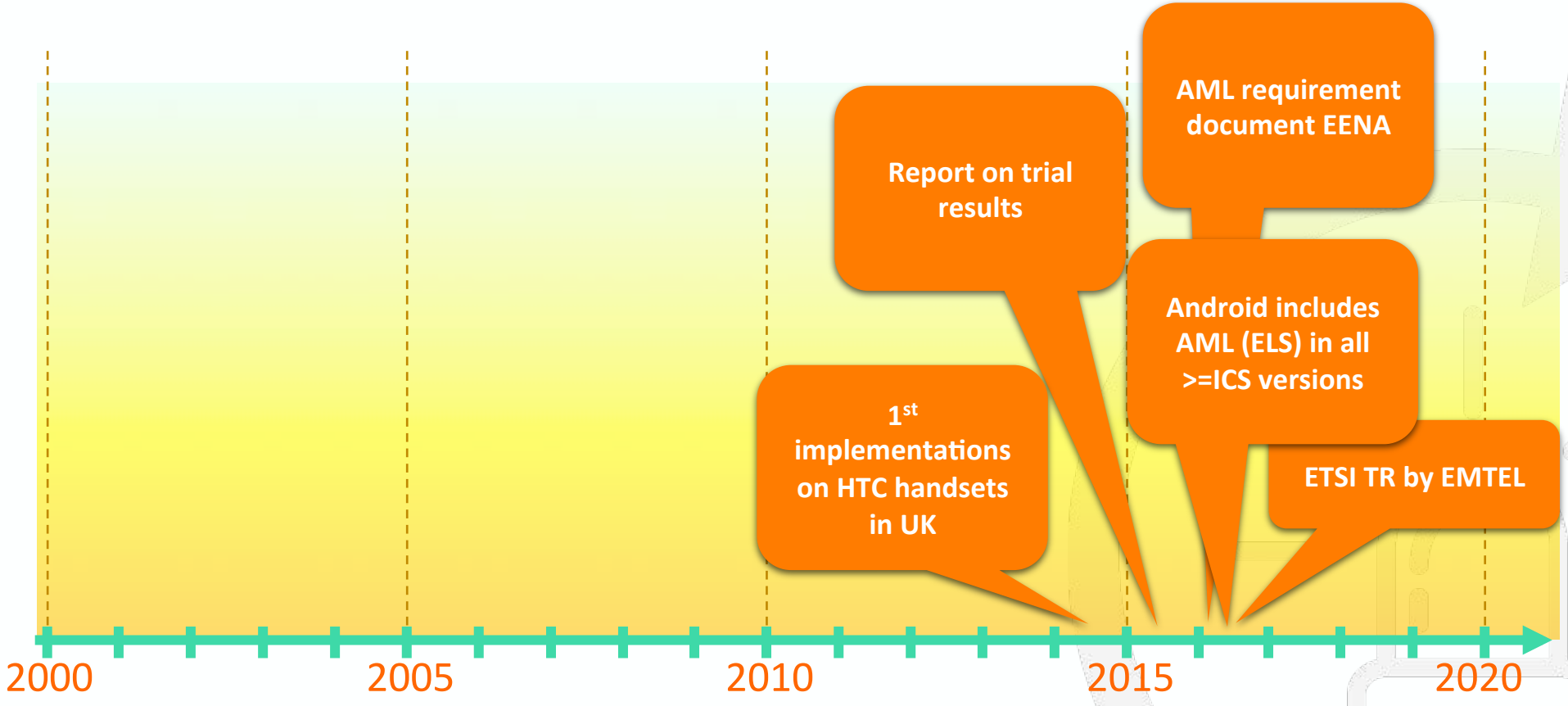
- SMS based
  - message attributes separated by a semi colon (;)
  - Each attribute consists of a name/value pair where names and values are separated by an equals (=) character



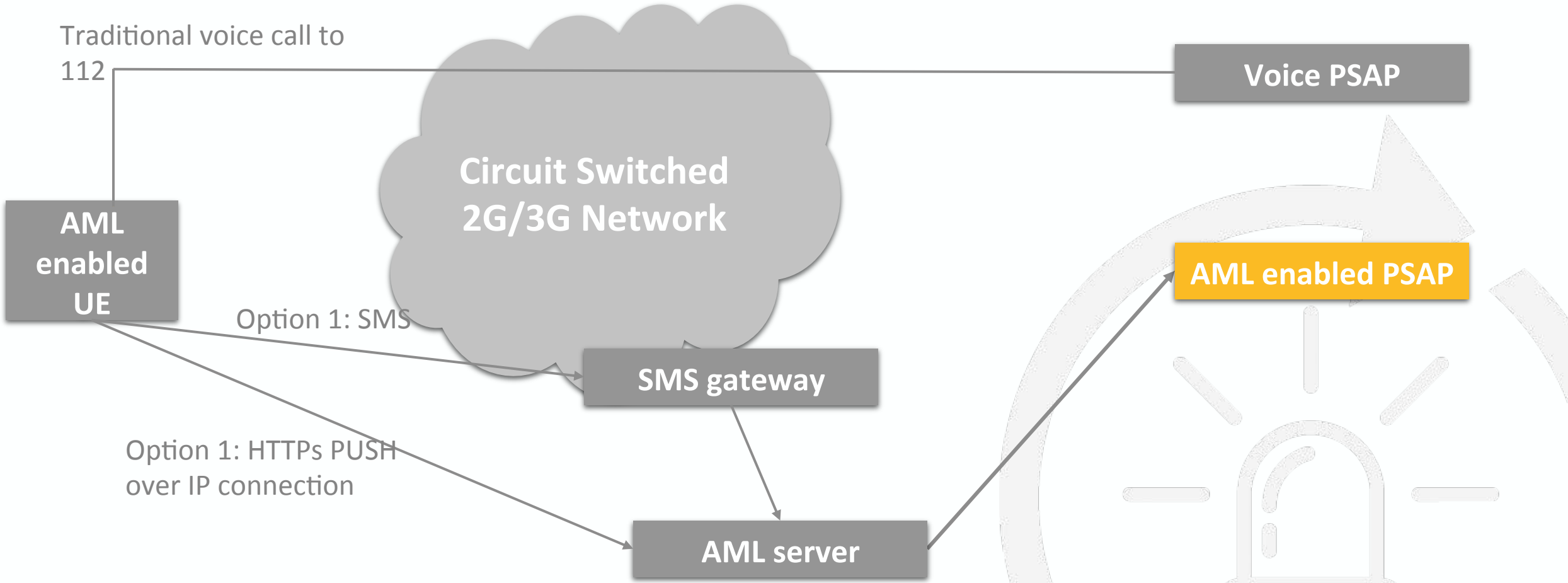
- HTTPs based:
  - Encapsulating the “Data SMS”

Ref: Advanced Mobile Location (AML) Specifications & Requirements, EENA

History of AML

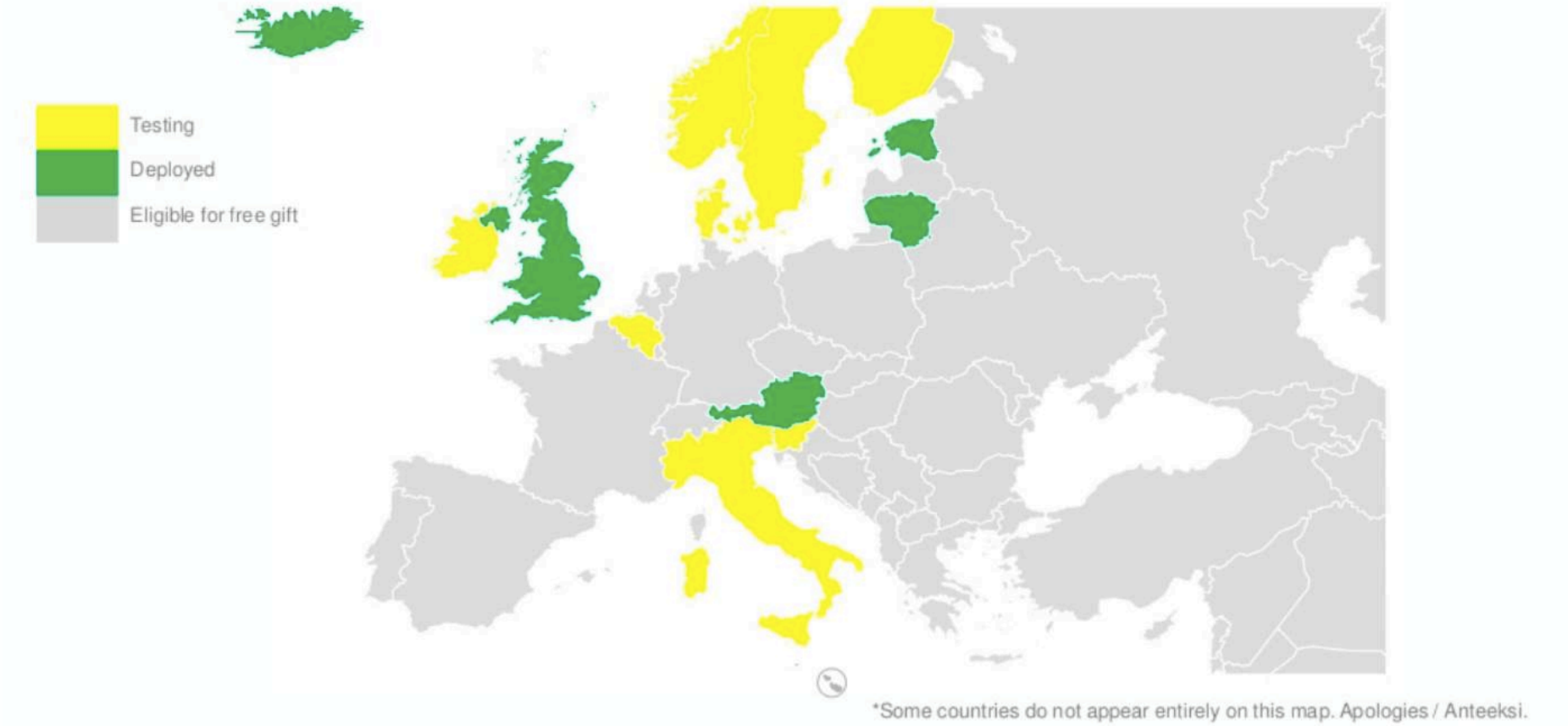


AML: Architecture

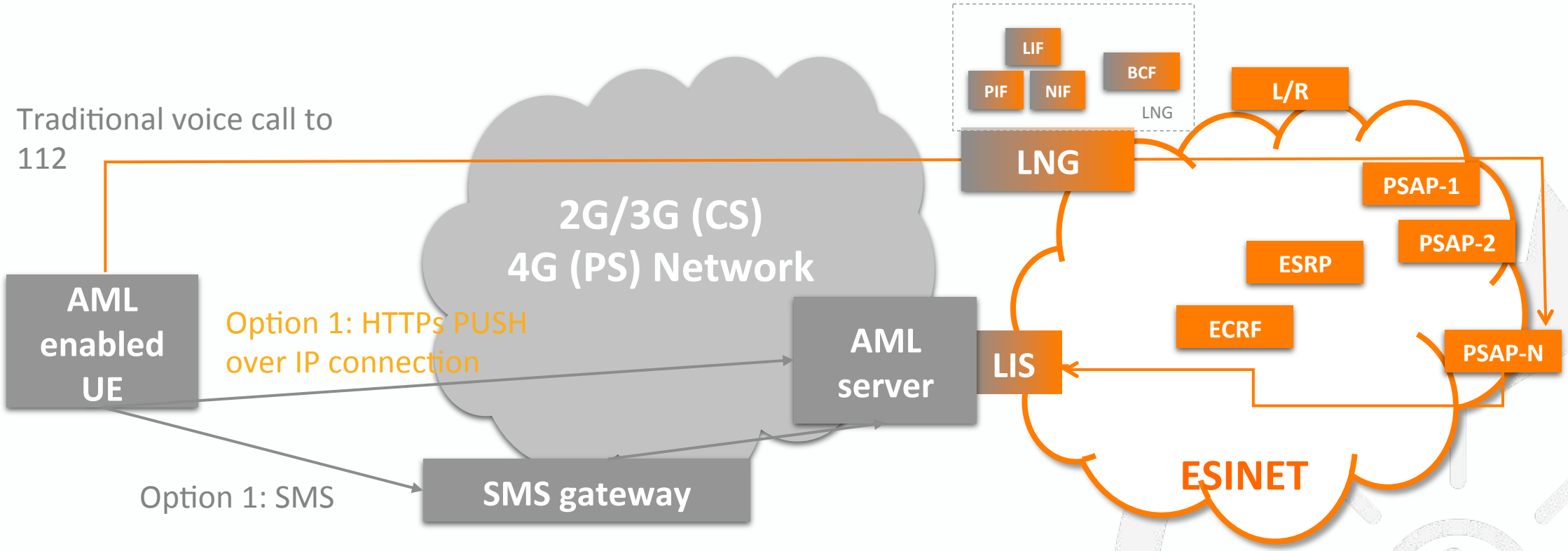


AML: Current status

Status of deployment (2017)



AML and NG112 interconnection example



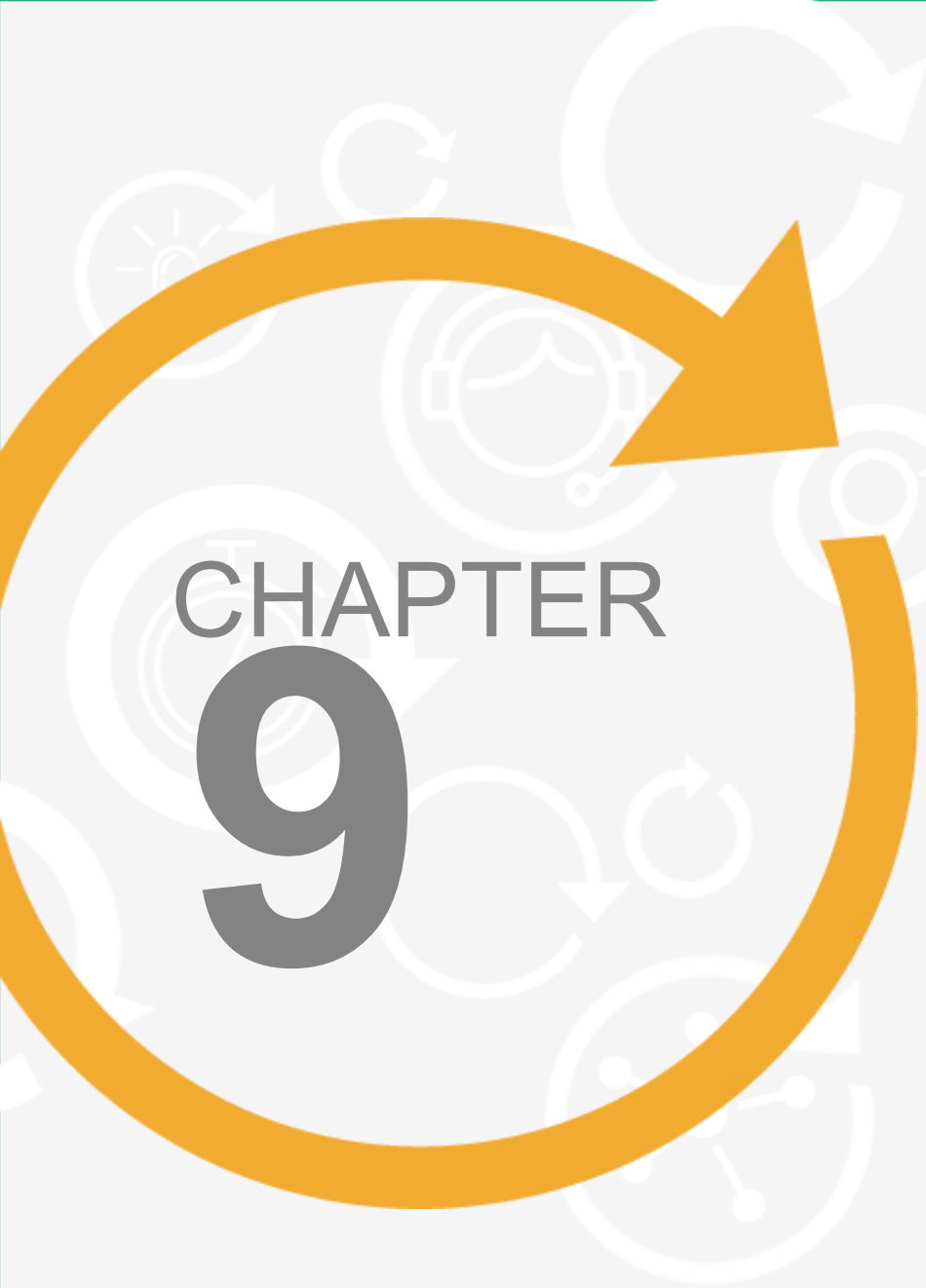
AML NG112 interworking for emergency calling
Location retrieval tested in 2nd NG112 Plugtest

Analysis of new landscape

Will AML…

- …replace …
  - No: location conveyance using traditional voice calls
- …complement …
  - It's a step forward as more-accurate-location providing originating network
- …push …
  - Raises awareness on the need to enhanced emergency communications
- …delay …
  - May reduce the urge from PSAPs to move to truly all-(Vo)IP

…*NG*112?



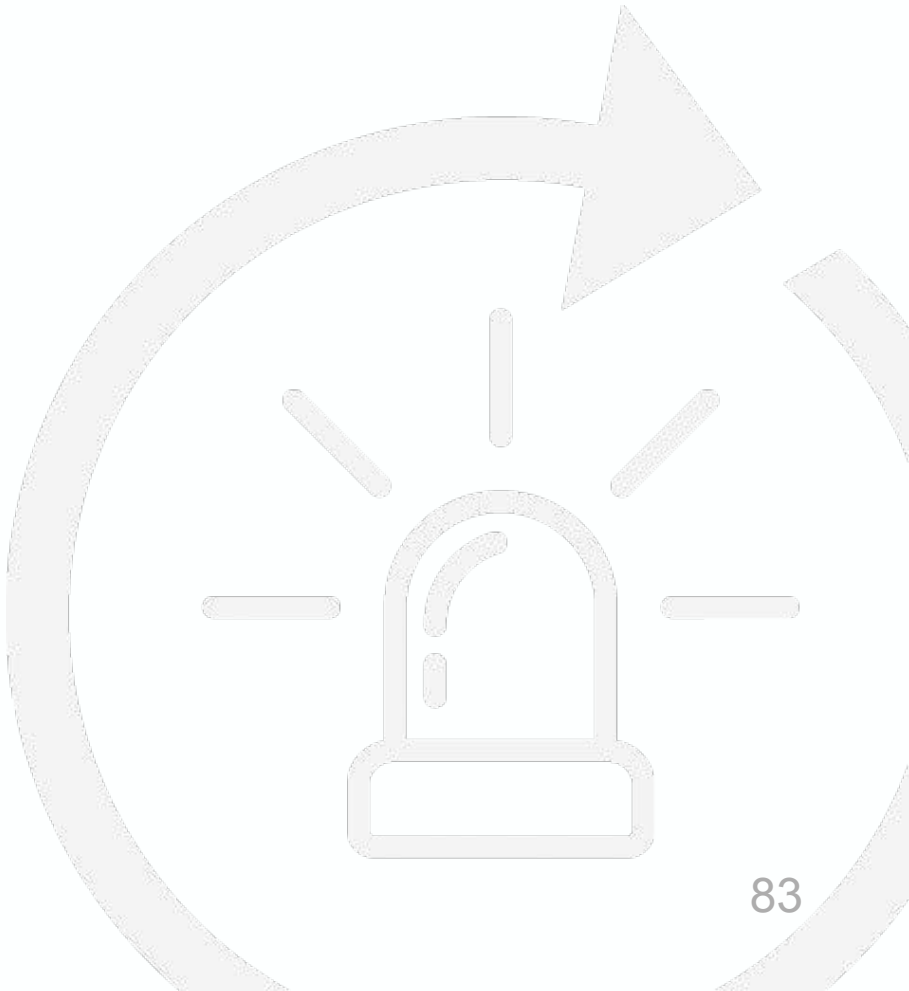
CHAPTER

9

WebRTC

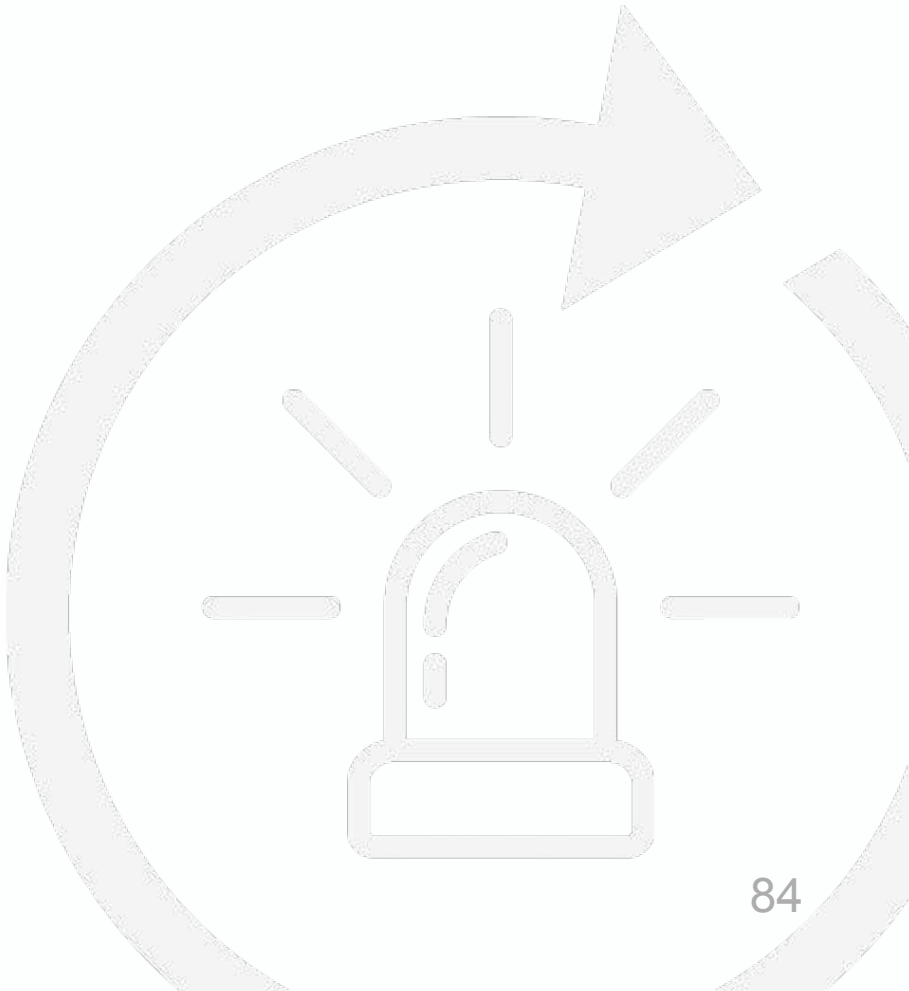
WebRTC: Main characteristics

- Easy/portable/plugin-free mechanism to bring multimedia to webapps/browsers
  - Solving common problems
    - NAT traversal/Security/Media processing/Codec “harmonization”/SIP complexity
- Driven by Open Source implementations in browsers
- Open Source project
  - Google, Mozilla, Opera, …
- Google
  - 2010
    - Open Source GIPs
  - 2012
    - Chrome
- Standardization efforts
  - IETF
  - W3C
- Almost P2P-capable and signalling agnostic
  - SDP offer/answer still needed



WebRTC: Key technologies/protocols

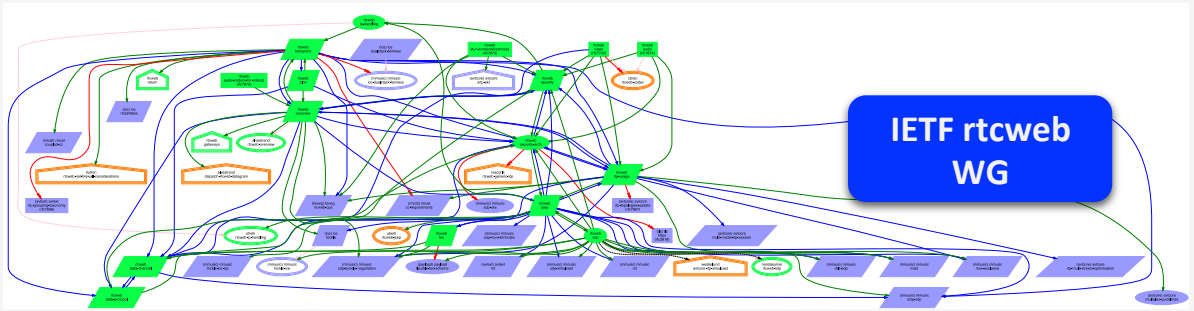
- Signalling
  - Implementation specific (SDP exchange)
  - Examples
    - SIP/XMPP/JSEP
- Media
  - RTP/DTLS
- NAT
  - ICE, STUN, TURN, RTP-over-TCP
- Codecs
  - OPUS, G.711 [G.722, iLBC, and iSAC]
  - VP8, H264

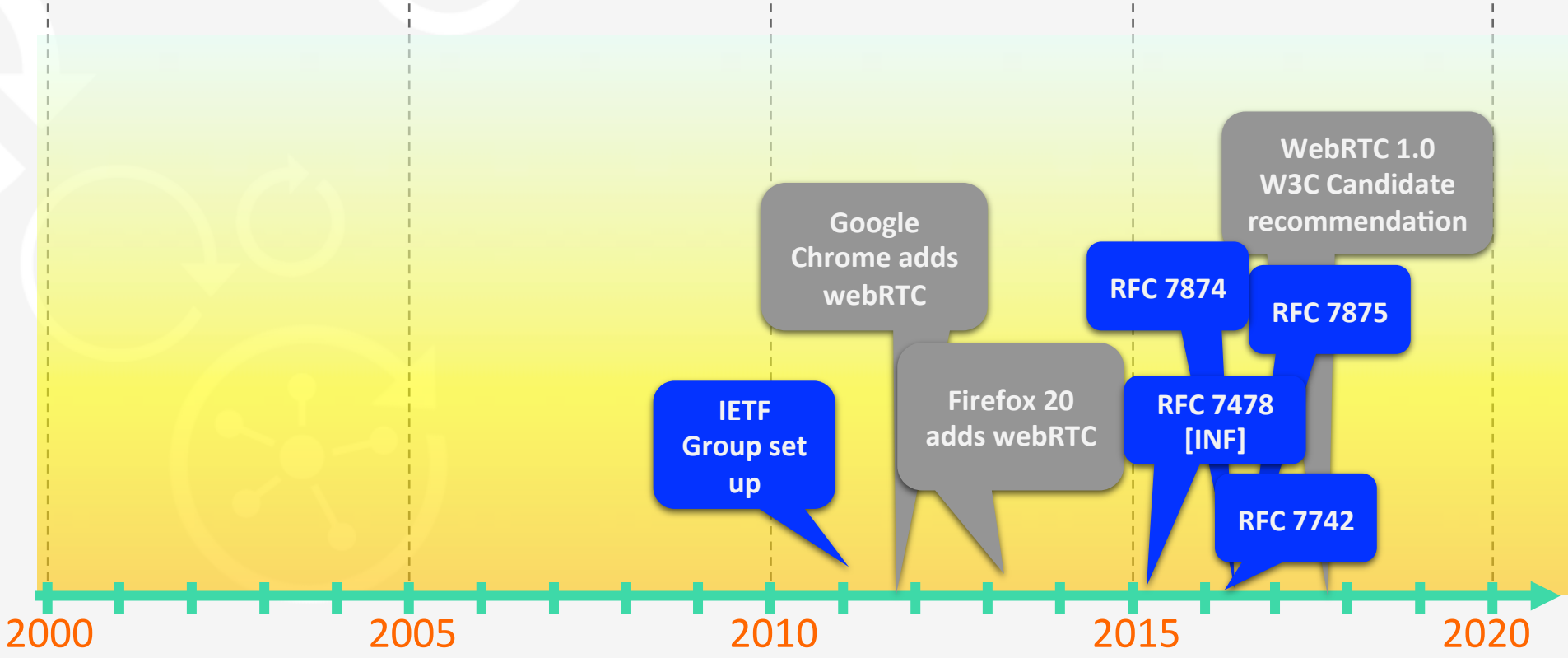


Ref: https://webrtc.org/faq/

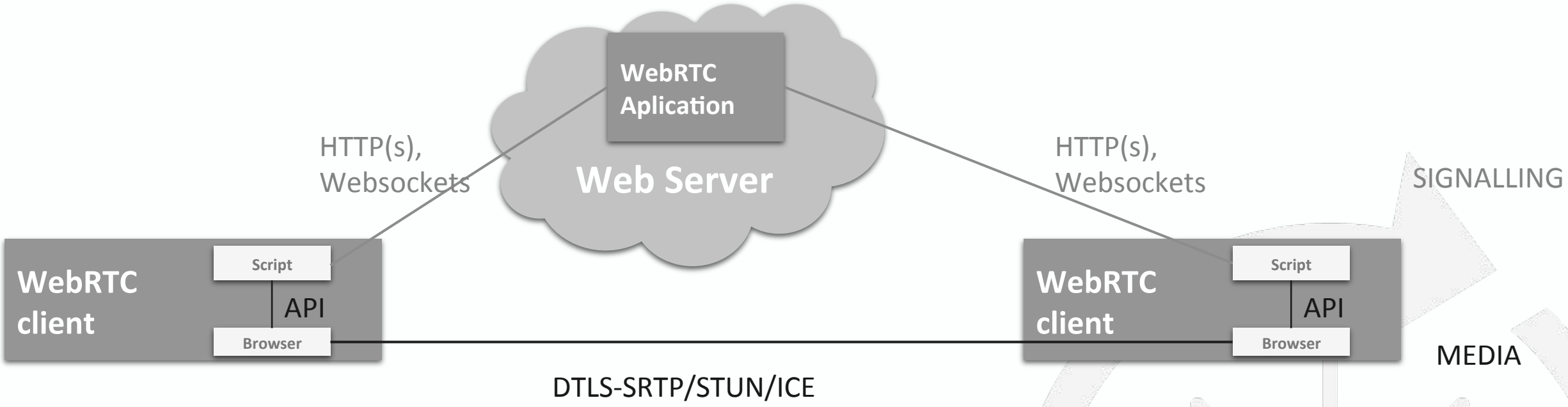
Ref: RFC7874 Ref: RFC7875 Ref: RFC7742

History of WebRTC





WebRTC: Architecture



Source: WebRTC and Emergency Services (EENA Document)

WebRTC and emergency calling

Option 1: Native ⇔ per-webrtc app-signalling needs to be added to the PSAP

Examples in WebRTC and Emergency Services (EENA Document)

REALRIDER

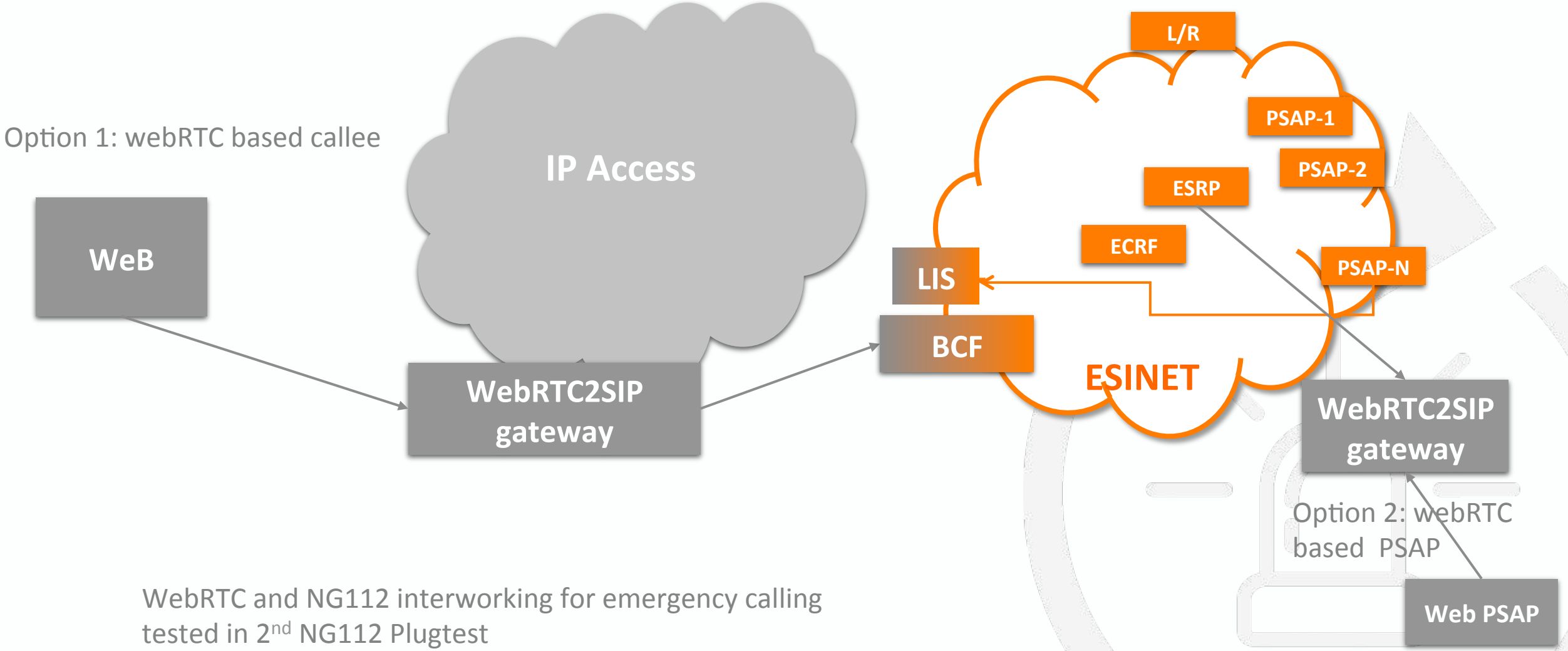
One Scream

EMERGENCY STREAMING

Option 2: webrtc-2-SIP/PSTN “breakout” gateway

Example in NG112 plugtest

WebRTC and NG112 interconnection example



WebRTC and NG112 interworking for emergency calling tested in 2nd NG112 Plugtest

Analysis of new landscape

Will WebRTC…

- …replace …
  - Not likely in the short tem: webRTC is a paradigm shift affecting any communications, foreseen impact would be related to “universal service”
- …complement …
  - Depend on webRTC penetration and evolution of “traditional telcos”
- …push …
  - By allowing easiest “built-in” access to media rich communications
- …delay …
  - NA

…NG112?

CHAPTER

10

Others

Source: https://www.mfcomm.co.uk/blog/bt-shut-pstn-isdn-networks-2025-business-ready/

PSTN shutdown

BT to shut down its PSTN and ISDN networks by 2025 – is your business ready?

Posted on 17th March 2017

Tweet 6 Like 5 Pin 0 G+

BT intends to phase out the UK Public Switched Telephone Network (PSTN) and Integrated Services Digital Network (ISDN) over the next few years

mechanisms for each country."

Deutsche Telekom aims to complete its transition to an all-IP network by 2018. It has already switched off its PSTN systems in Macedonia and Slovakia and expects to have made the all-IP jump in Croatia by the end of this year, while in its large domestic market a quarter of customers are now using all-IP services.

The French telecom operator Orange has already informed the French authorities of its intention to cut off the PSTN network, although a specific date has not yet been revealed. Both business enterprises and individual households should be ready for the transition, which is most likely to happen by 2020. The French regulator has already said that it will not oppose such a move but also specifies certain requirements. These requirements include providing alternate and equivalent services before shutting down the PSTN and also a five-year advance notice for customers.

Similar discussions and preparations are also underway in the UK and Germany by Deutsche Telekom and BT. While BT has targeted a date of 2025 for the switch off, it will no longer provide new services or systems for customers starting from 2020. Deutsche Telekom is far more aggressive targeting a date of 2018 for the transition to VoIP. While 2025 may seem a long way off, it is not too soon for businesses to begin preparations.

In the US, carriers such as AT&T have already started trials of VoIP services and the FCC has already declared its intentions of allowing providers to switch off the PSTN after the needed preparations. The concerns of the regulators are similar to that of the French authorities i.e. customers should not face a decline in the quality of service or any disruption as an operator moves over to using

Source: https://voipstudio.com/pstn-switch-off/

All-IP. This network will integrate mobile communications and fixed-line network technology. The objective is to have the customers across Europe migrated to IP by the end of 2018."

The latest commitments have come from British Telecom, which, after looking at the opportunity for a number of years, announced its intention to move all its customers off legacy networks by 2025. AT&T has also been actively working with the FCC to drive the transition in the US. In the diagram below, we can see some of the announcements from major service providers around the world.

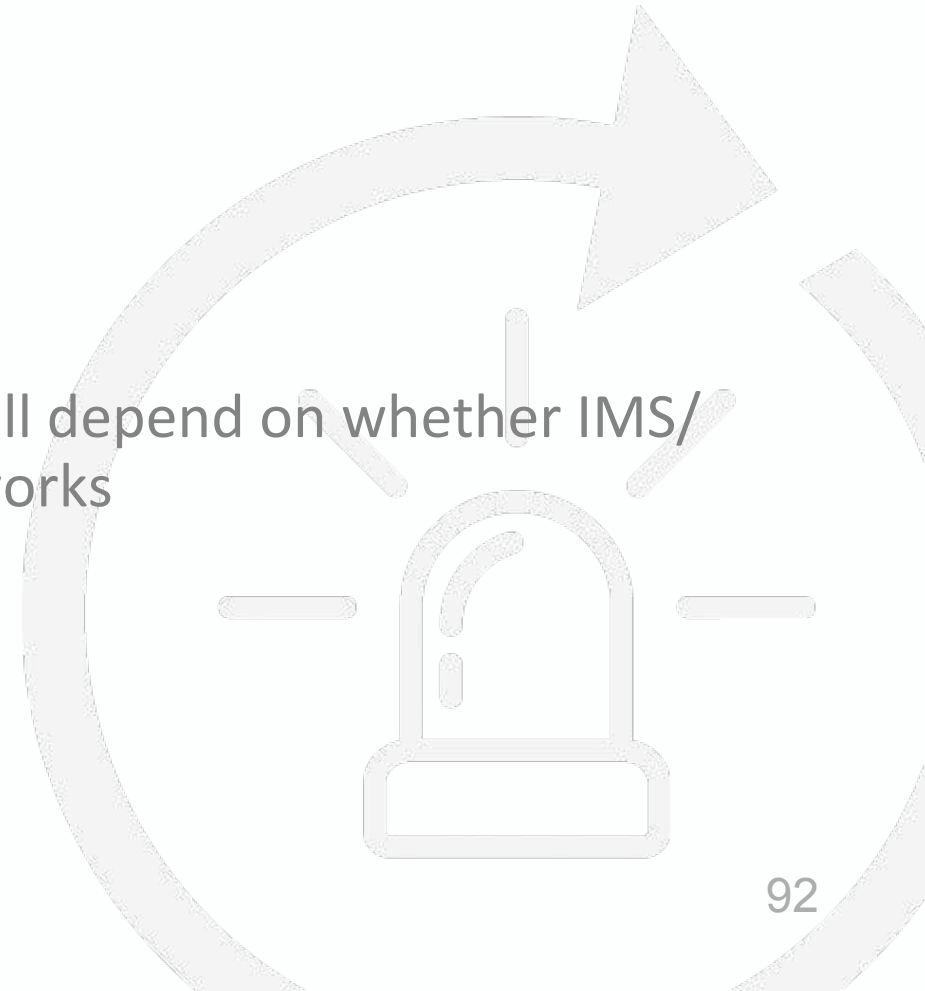
Operator	Country	Transition Date	Source
AT&T	USA	2020	AT&T Investor presentation & http://www.attpublicpolicy.com/
CenturyLink	USA	Made Request to FCC 06/2015	FCC filing [1]
Verizon	USA	2018-2020	Verizon Policy Blog[2]
BT	UK	2025	BT Investor presentation Jan 2015
NTT	Japan	2025	Announced in 2010: http://www.ntt-west.co.jp/news_e/1011/pdf/101102a_1.pdf
Telstra	Australia	2021	http://www.telstrawholesale.com.au/nbn/nbn-transition/index.htm
Deutsche Telekom	All major countries	2018	http://www.telekom.com/media/company/214696
Swisscom	Switzerland	2017	https://www.swisscom.ch/ [3]

[1] http://apps.fcc.gov/ecfs/comment/view?id=60001073108
[2] http://publicpolicy.verizon.com/blog/entry/verizon-responds-to-the-fcc-fiber-is-better-even-for-pots

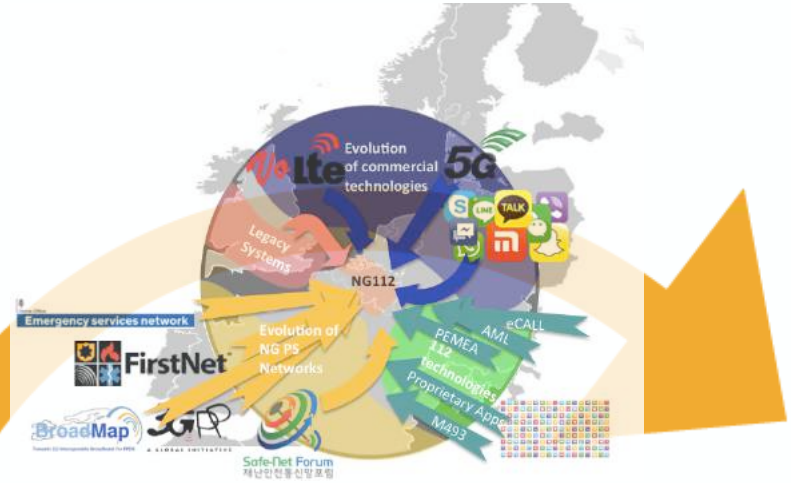
Analysis of new landscape

Will PSTN shutdown…

- …push …
  - Probably, due to the need to become (Vo)IP but will depend on whether IMS/ VoLTE/RCS is monopolizing all the originating networks



…NG112?



CHAPTER 11

MCPTT

MCPTT: Main characteristics

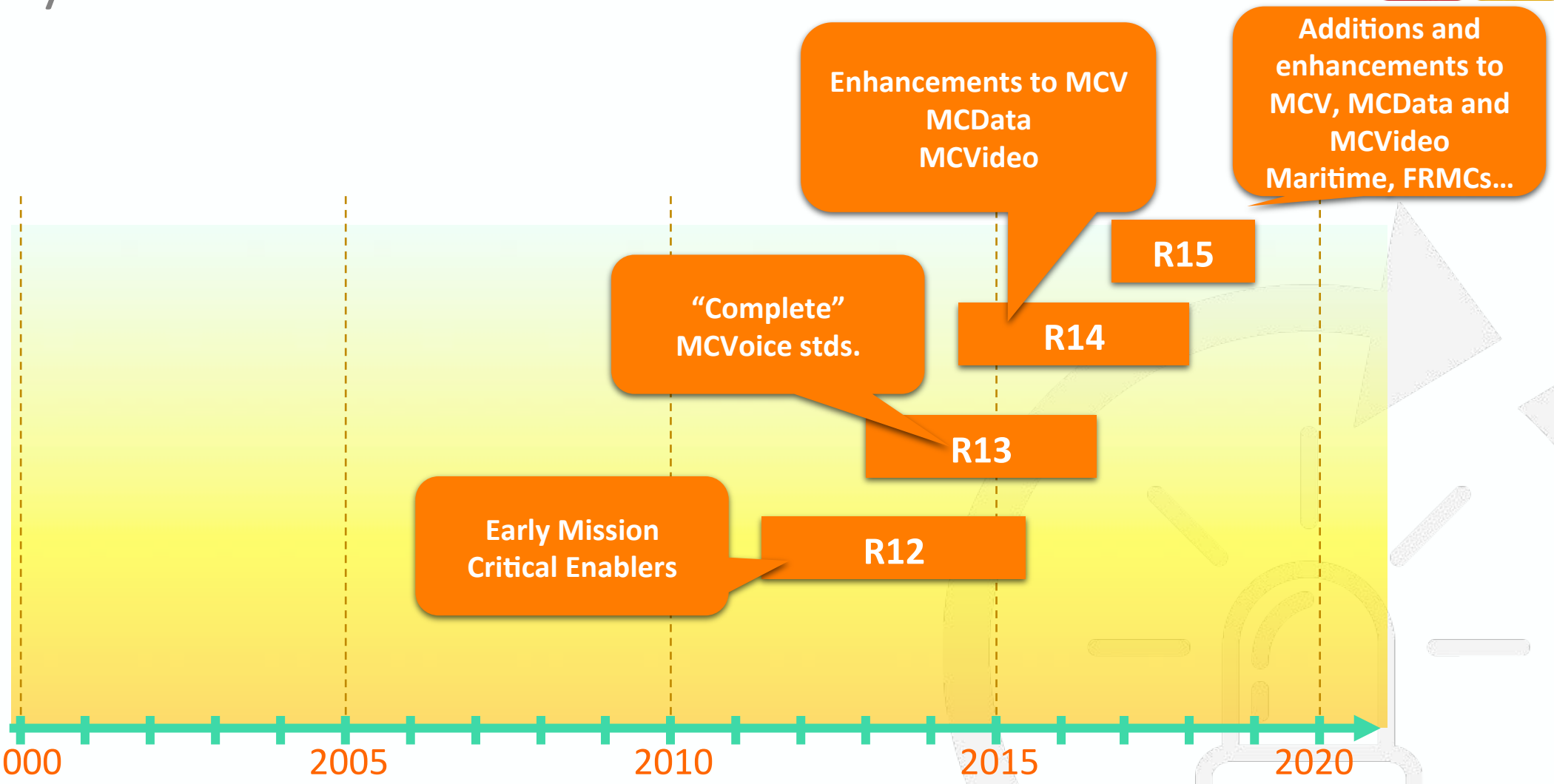
- Driven by 3GPP
  - Not purely telcos but SA6, pushed by HO/MoI from different countries (UK, US, FR…)
- Communications among first responders
- Evolution from narrowband PMR to broadband VoIP based MC services over SIP/IMS over LTE
  - IMS core “optional” but highly visible in some TSs
  - LTE anchors for PCC (MCPTT-5 Rx Interface) and Multicast (eMBMS MB2-U/C interfaces)
- Standardized in Rel’13
  - MC-Voice (MCPTT)
- Would not only cover Public Safety but also extendable to Public Transport, utilities, …
  - Maritime
  - Railways (FRMCS)
  - Other… “towards MC-everything”

MCPTT: Key technologies/protocols

- Signalling:
  - SIP/SDP+RTP
    - Specific headers => problems with SBCs
    - + XML encoded multipart bodies to convey MCPTT specific information (mcptt-info)
  - RTCP-app based Floor Controlling
  - XCAP (HTTP, IMS Ut-like)
  - CSC servers for OAM, AAA, Group Management, Key exchange and binders to LTE
    - OpenIDCore Connect, Diameter, others…
- Media
  - MCVoice: codec AMR-WB (mandatory), EVS optional
  - MCVideo: H264 AVC (mandatory),other profiles and H265 (HEVC) optionals
  - MCData: specific (i.e. SDS)
- Location
  - MCPTT specific location conveyance (vnd.3gpp.mcptt-location-info+xml!= pidf-lo)

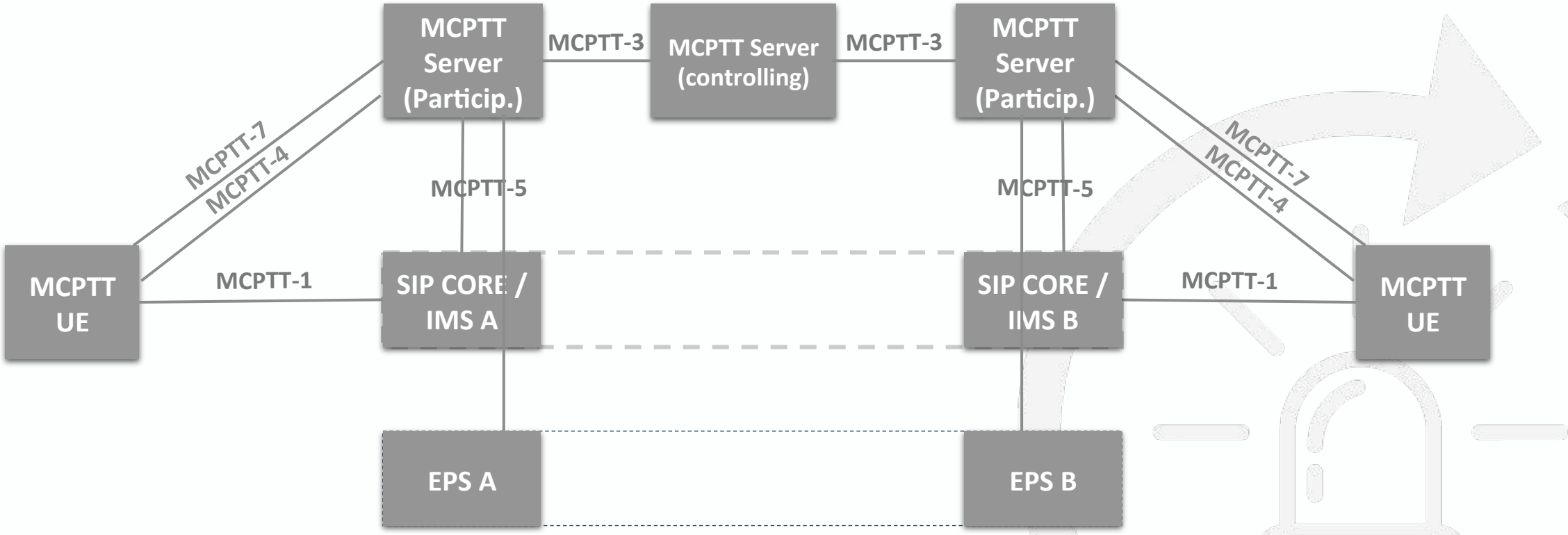
Ref: 3GPP TS 24379, TS 26281, TS 24282

History of MCPTT



Ref: http://www.3gpp.org/news-events/3gpp-news/1875-mc_services

MCPTT: Architecture (Application plane unicast- simplified)



Ref: TS 24379

Analysis of new landscape

Will MCPTT…

- …replace …
  - Not: targeting communications among first responders only
- …complement …
  - Yes, possible information traversal from citizens to first responders through the contro room/dispatcher might take advantage of common VoIP based framework (i.e. IMS)
- …push …
  - Probably, depending on joint national activities NGPS/NG911 (to be analyzed later) capable national networks
- …delay …
  - Will depend on whether budget allocation is moved from possible NG112/NG911 migrations to NGPS ones in hybrid organizations

…NG112?

CHAPTER

12

(supra) national initiatives

Ongoing (supra)national initiatives

- Mostly PS driven
  - But good synergies
    - Interconnection
    - Testbeds/evaluations
- Examples
  - Europe
    - UK ESMCP
    - Broadmap/Broadnet
    - FR
  - US
    - Firstnet
  - Korea
    - Safenet

Common analysis

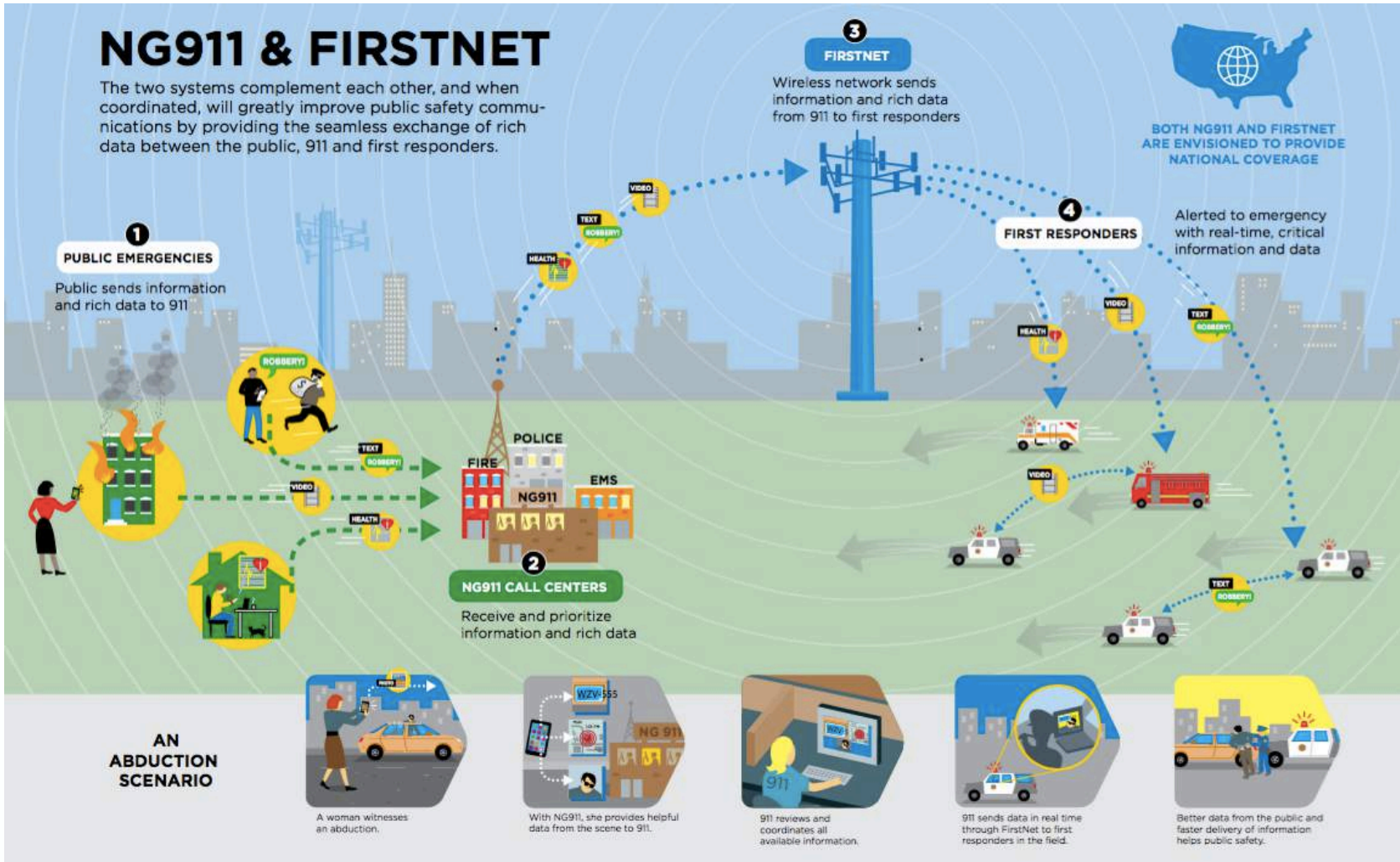
- Does it make sense to share common technology instead of legacy multi technology voice only matrix among?
  - Citizens
  - PSAPs
  - First Responders
  - Authorities

Probably YES

Example: Sharing data from citizens to FRs

Source: NG911 & Firstnet ..

by The National 911 Program and NASNA



UK ESMCP

- Frontrunner
  - Pre-standard
- Control room upgrade
  - Considered as “enabling project”
  - Reference to enhanced emergenc communication from citizens not explicit
    - AML, ecall, 999eye, NG112….

Enabling projects

The programme is also managing a number of projects to support the main procurement:

- user devices and accessories
- vehicle installations
- air to ground (A2G) network
- control room upgrades, this may require:
  - upgrading the 200+ integrated command and control systems
  - connection to the public service network
  - connection to mobile data systems, fire mobilising systems and command and control systems
- extended area services, this project will take account of:
  - the mobile network operators commitment to provide 98% in building coverage by population
  - the mobile network operators commitment to provide 90%
  - the mobile infrastructure project, a government initiative tc coverage

IET The Institution of Engineering and Technology

CPD http://www.theiet.org/cpd

Contacting **Emergency Services** in the **Digital Age**

JA: What about the opportunity to introduce MAIT and Next Gen 999 at the same time?

Geoff Naldrett: There is this concept of only digging the road once, and so whatever other technology is around, you should try to incorporate that at the same time. MAIT is one of those things. Then there is the whole modernisation of Next Generation 999 calling. BT is desperate for some guidance from Government as to what its PSAP needs to be capable of, and there's undoubtedly a knock-on effect from that through the control room and out the other side.

Source: Ref:http://www.wireless-mag.com/esn/RoundTables/40798/esn-round-table.aspx

US Firstnet & NG911

- Need to align Firstnet and NG911 under ongoing discussion
  - In principle budget not allocated

HOW WILL THE FIRSTNET NETWORK BENEFIT PSAPs?

Using the FirstNet network will improve situational awareness and decision-making. The Fir
network will make it possible to use new tools that support faster parallel processing. The F
network will enable the exchange of real-time data and audio/video feeds between PSAPs
and hospital staff. This kind of connection, while units are on the scene and during transpor
improve all levels of pre-hospital care.

Where does the Data from FirstNet and Next Gen 9-1-1 converge?

AT THE PSAP

The NG911 Funding Gap

While FirstNet gets $7 billion, next-gen 911 gets $150 million from the feds.

David Raths, Contributing Writer | August 2, 2016

GOVTECH WORKS
Presented by General Dynamics IT

SECTORS TOPICS TALKING TECH SUBSCRIBE

FirstNet and NG911: Pushing in the Same Direction

by David Silverberg | Mar 22, 2016

Office of the Chief Information Officer
Washington State

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Bringing PSAPs into the Planning Process for Public Safety Broadband

Home » Bringing PSAPs into the Planning Process for Public Safety Broadband

HOME INSIGHTS

FirstNet and ESInet Commingled, Maybe Not Such a Good Idea

POSTED BY: EDITORIAL STAFF OCTOBER 20, 2017

We have written in the past about how communications centers operate within this new world of FirstNet in **FirstNet And The Public Safety Communications Center**. There are those in our profession who think that the NG ESInet should be integrated into the FirstNet network or more specifically want to use their state ESInet networks as part of FirstNet. In our view this may not be such a good thing, for many reasons. We don't want to get into the weeds on some of these issues but everyone needs to understand that most 911 networks are regulated at several levels, whereas FirstNet is a contracted network AT&T is providing to FirstNet. For those involved at administrative levels you most likely would agree that commingling these two would be an administrative nightmare and not good public policy.

US Firstnet & NG911

Source: NG911 & Firstnet Together Building the future of Public Safety Communications by The National 911 Program and NASNA

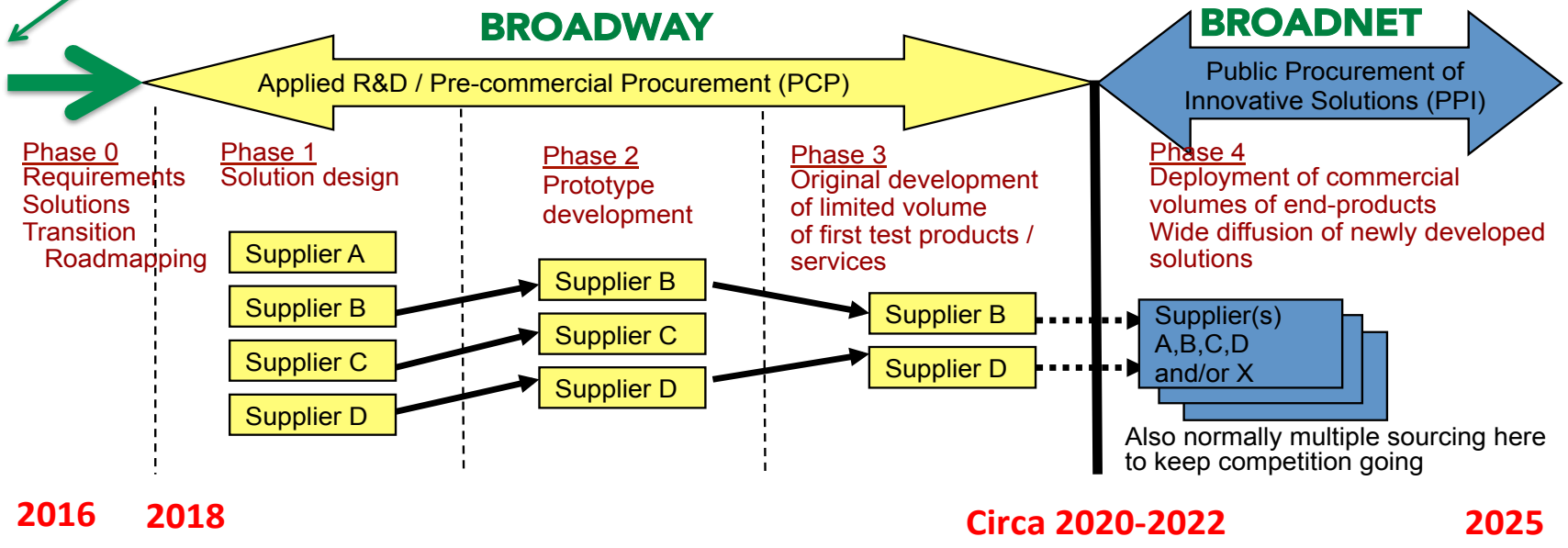
Broadmap/Broadnet

- European Initiative (through H2020 funded R&D projects and PCP) towards o achieve future evolution of European broadband applications and **interoperable** radio communication solutions
-

BROADMAP

Co-ordination and Support Action (CSA)

BROADMAP will inform Horizon 2020's co-funded procurement process which will likely use the PCP and PPI instruments of H2020 and/or other instruments such as the International Security Fund (ISF). The diagram below illustrates an expectation of timeframe. BROADMAP constitutes Phase 0.



2025 – Commercially Deployed Interoperable Broadband Applications, Services, Networks, Devices for PPDR

Ref: Broadmap project

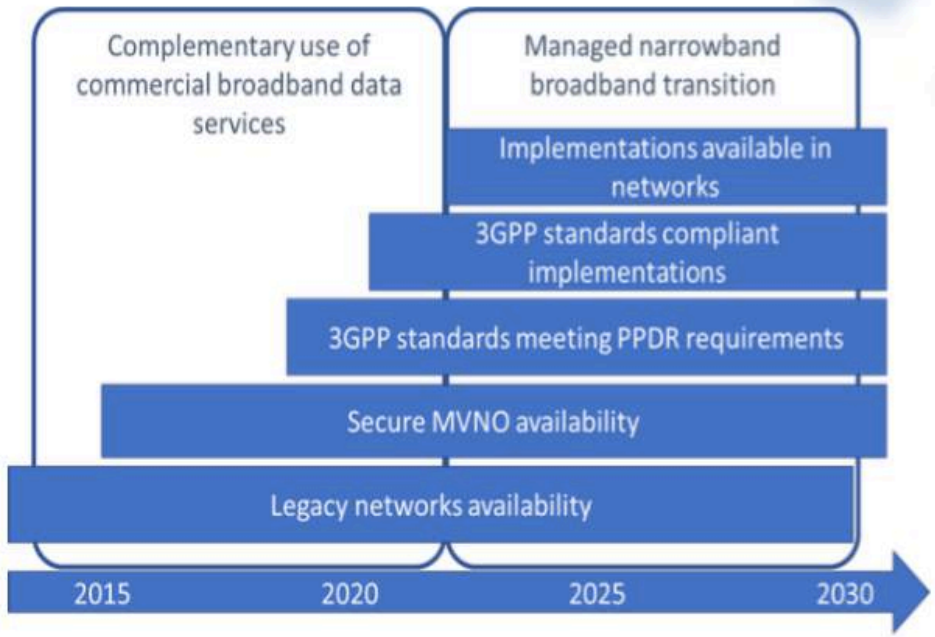
Broadmap/Broadnet

- Objectives:
  - To collect, assess and validate the PPDR's wireless broadband communication requirements
  - To establish a core set of specifications to fulfil the requirements
  - To define transition roadmaps for research and standardisation for future evolution of European interoperable radio communication solutions, within legal procurement constraints
  - To prepare the ground for a new eco-system to catalyse new applications, services and processes making use of broadband capabilities for Public Safety and Security

Ref: Broadmap project

Broadmap/Broadnet

- Focus on PPDR only
  - Gradual approach



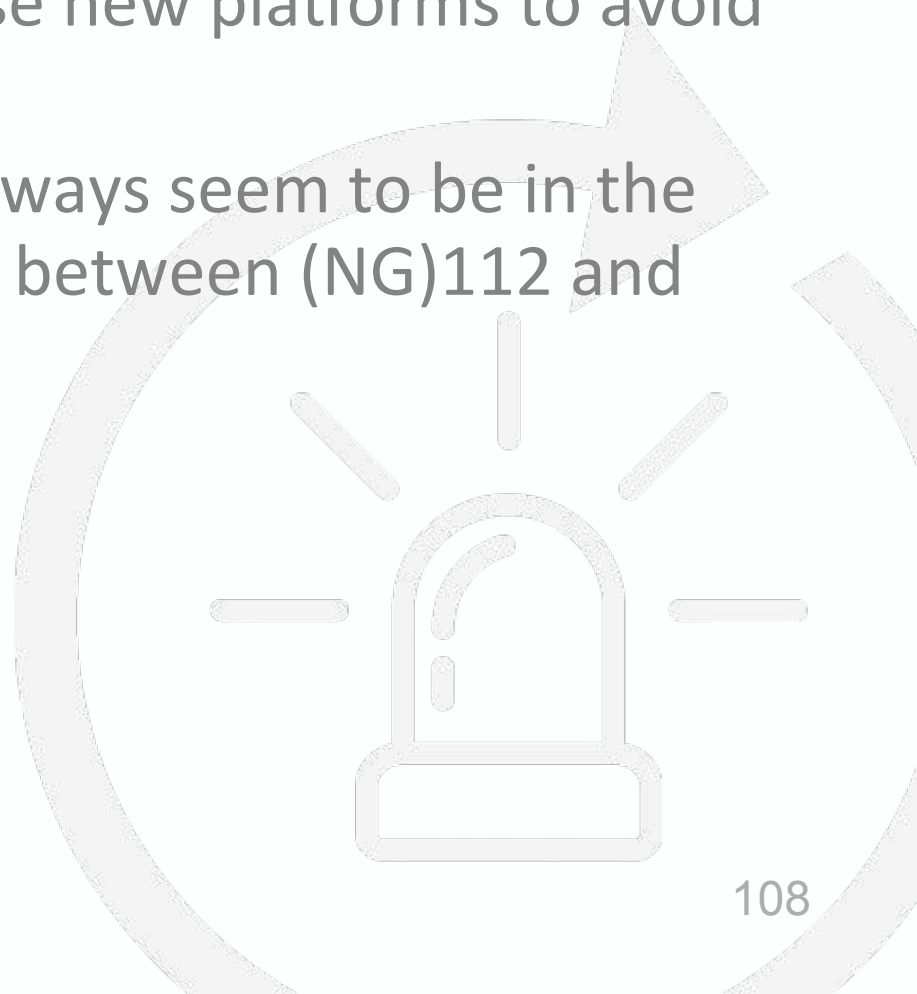
- Starting point 3GPP REL15
- No harmonized EU wide strategy how to provide PPDR mobile broadband services
- To maintain high level PPDR services, a step by step approach from legacy systems to next generation MC broadband services is essential
- Also transition strategies are missing in several countries
- Transitions must be adapted to various national conditions

- But integration with citizens (i.e. NG112) of a possible European high scale testbed worth considering

Ref: Broadmap project

Conclusions

- Public safety (supra) national initiatives are gaining momentum and may result in possible cooperation opportunities
- Need to foster awareness on NG112 within these new platforms to avoid reinventing the wheel
- Control Rooms and radio-multi-technology gateways seem to be in the near term the common interfacing mechanisms between (NG)112 and other emergency technologies



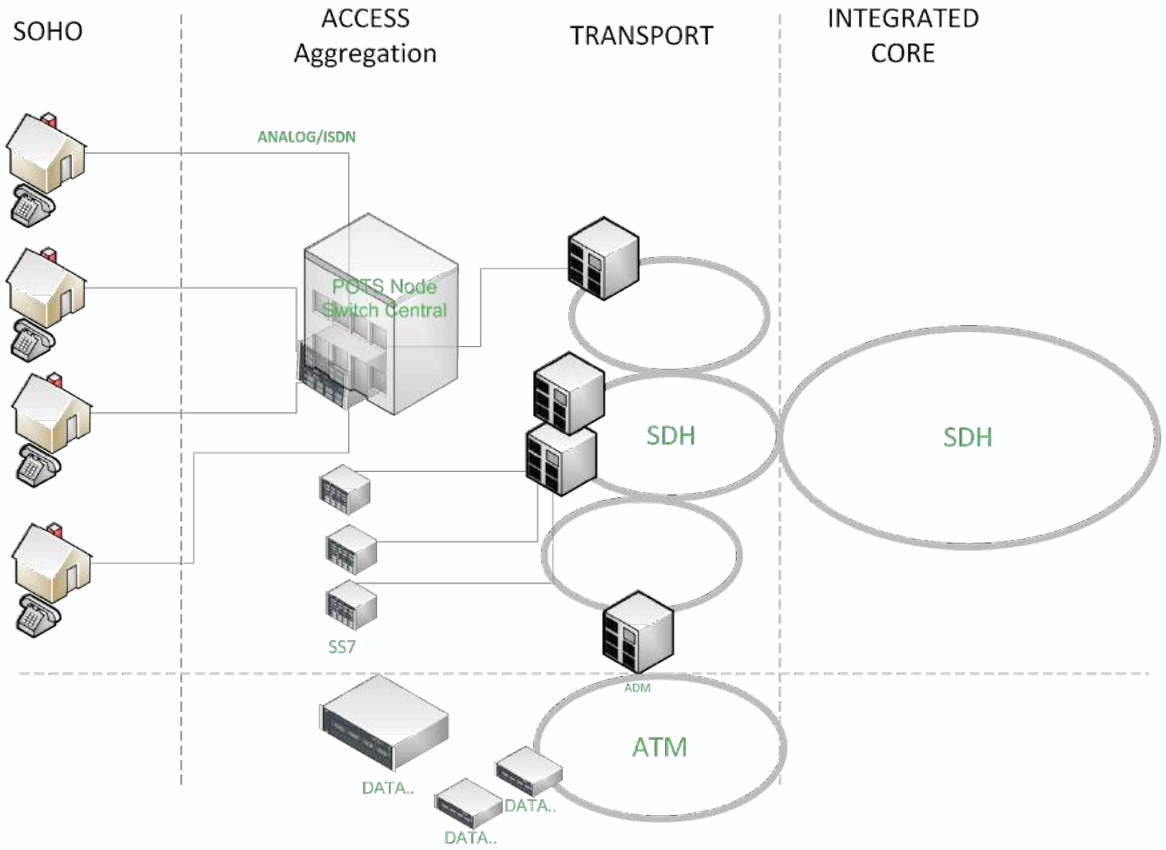
CHAPTER

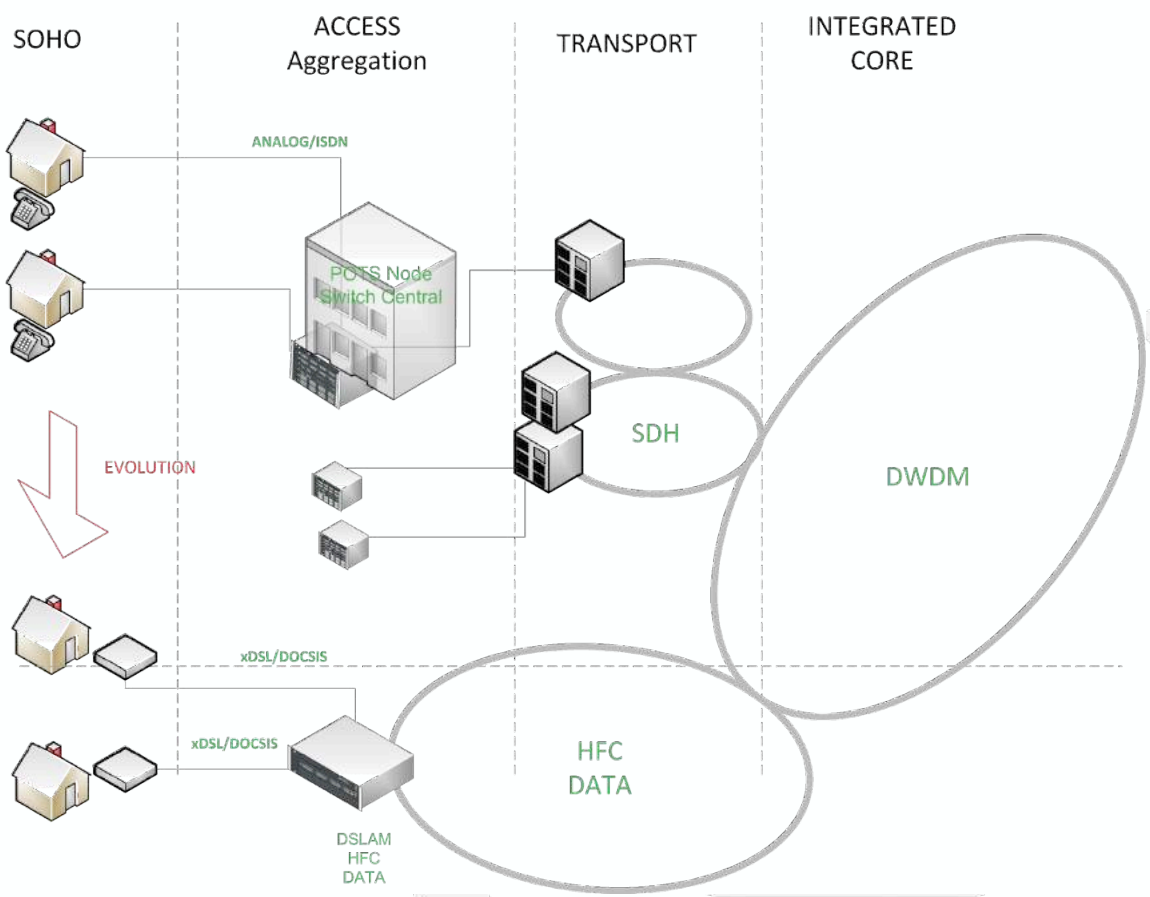
13

Conclusions

Would NG112 be “NG” networks friendly?

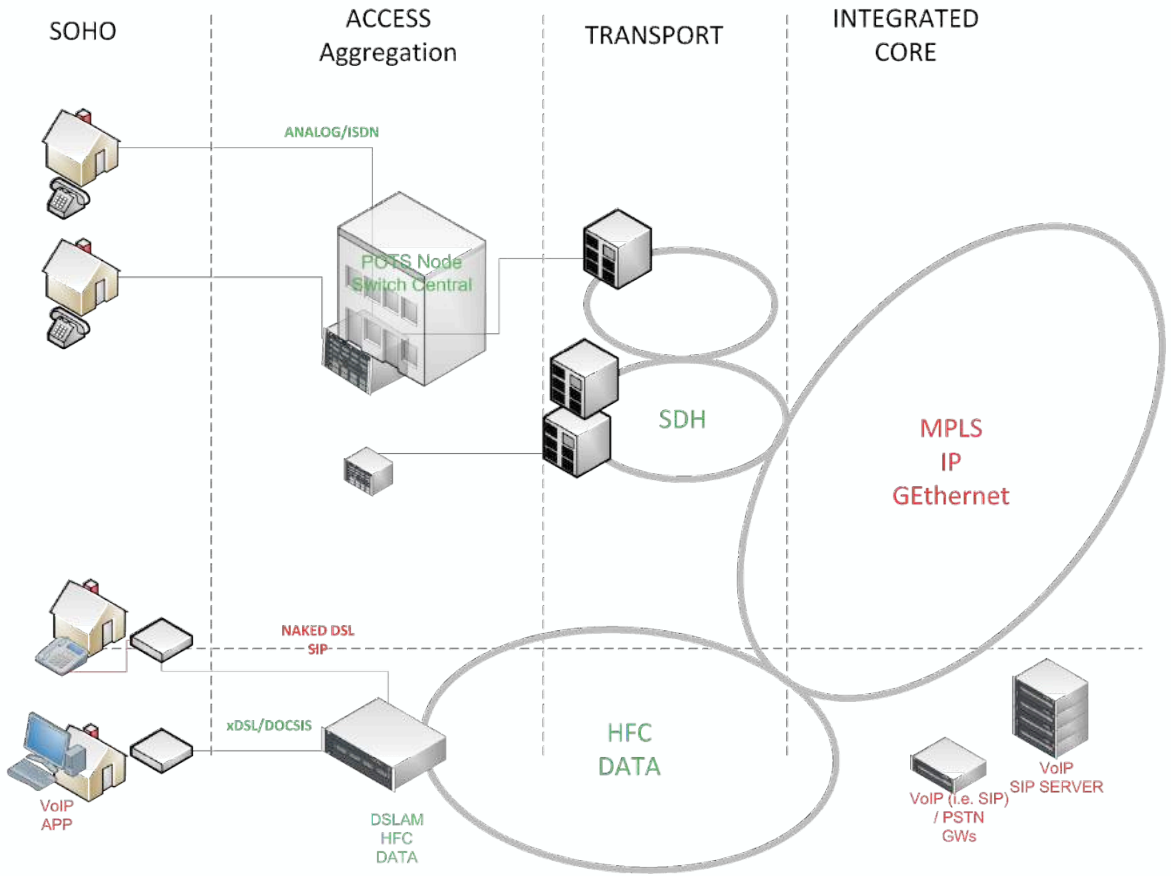
- Evolution of MVNO technology…

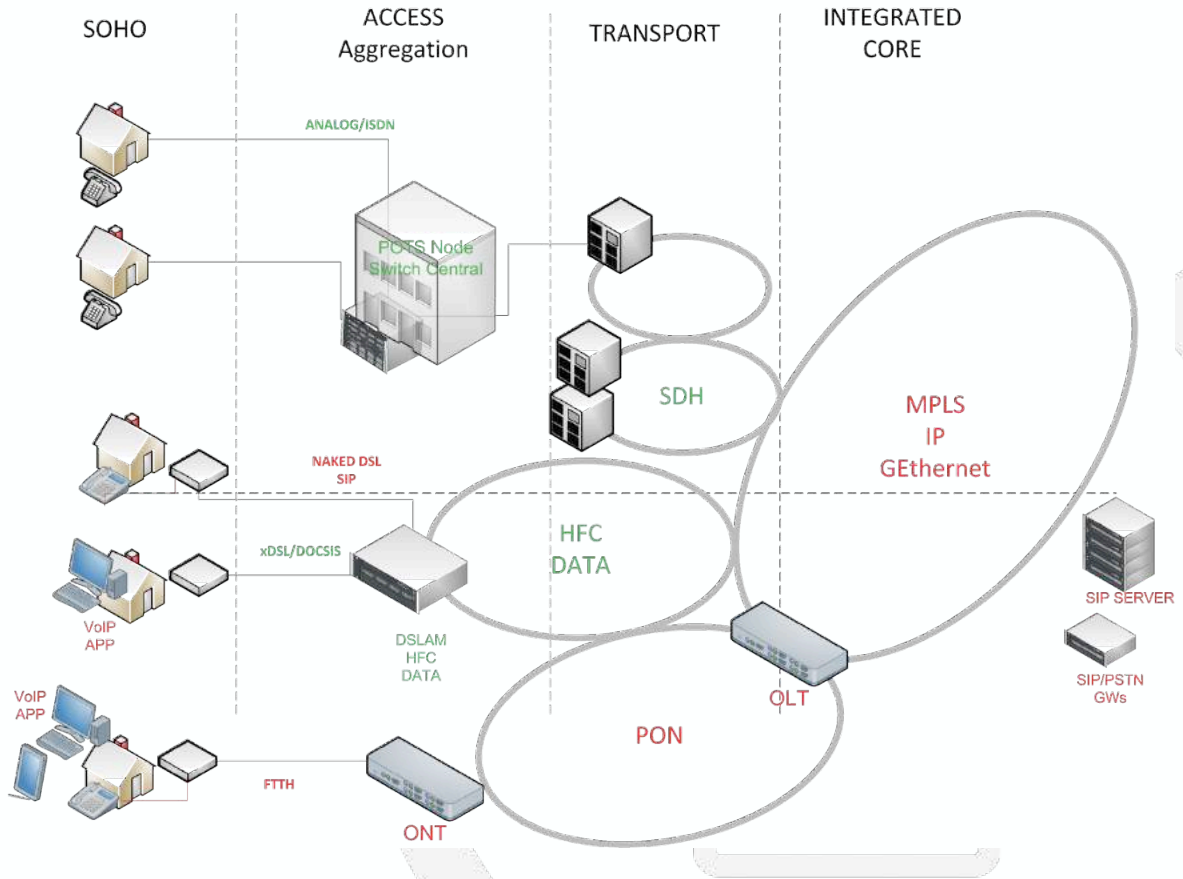




Would NG112 be “NG” networks friendly?

- Evolution of MVNO technology…

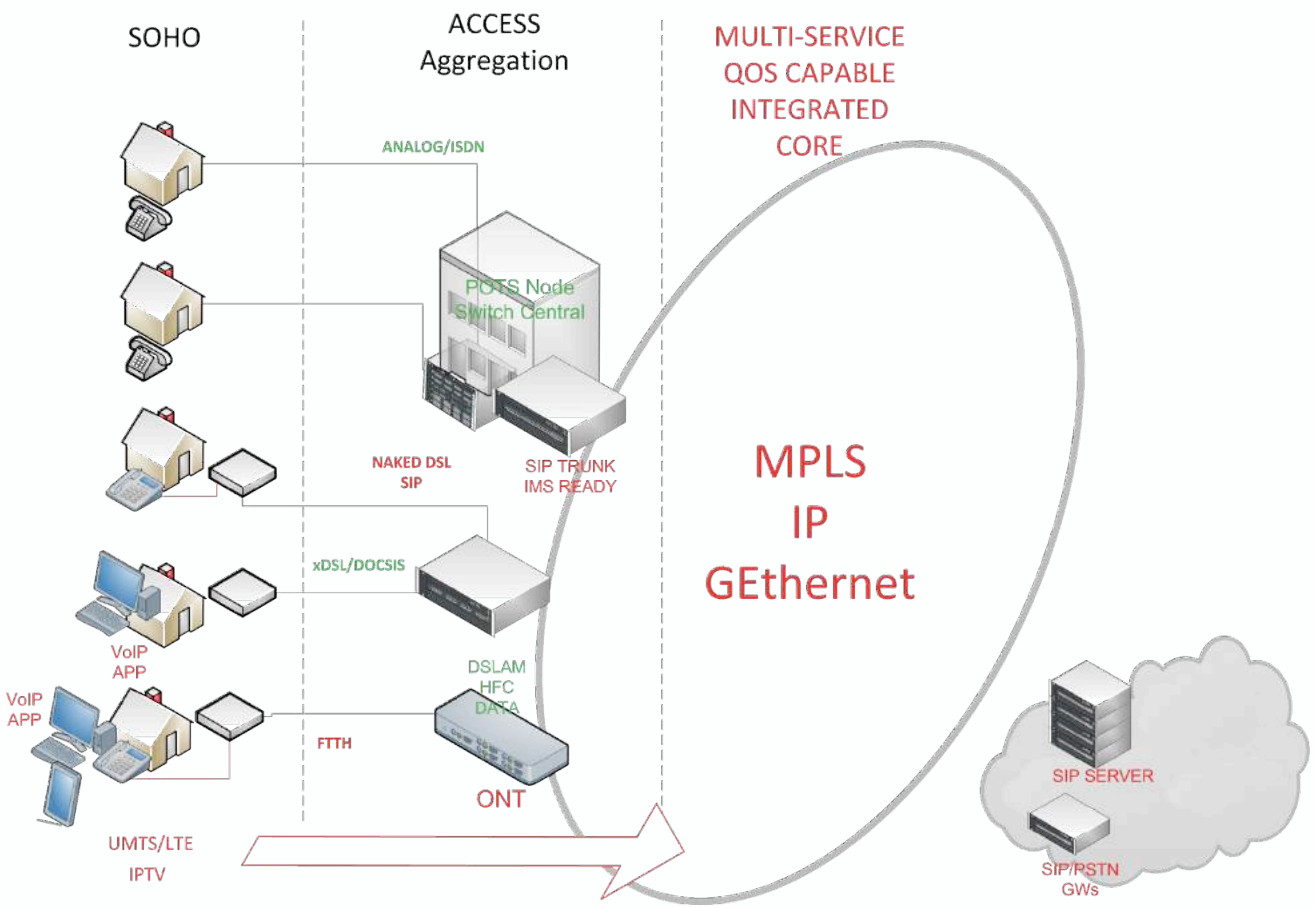


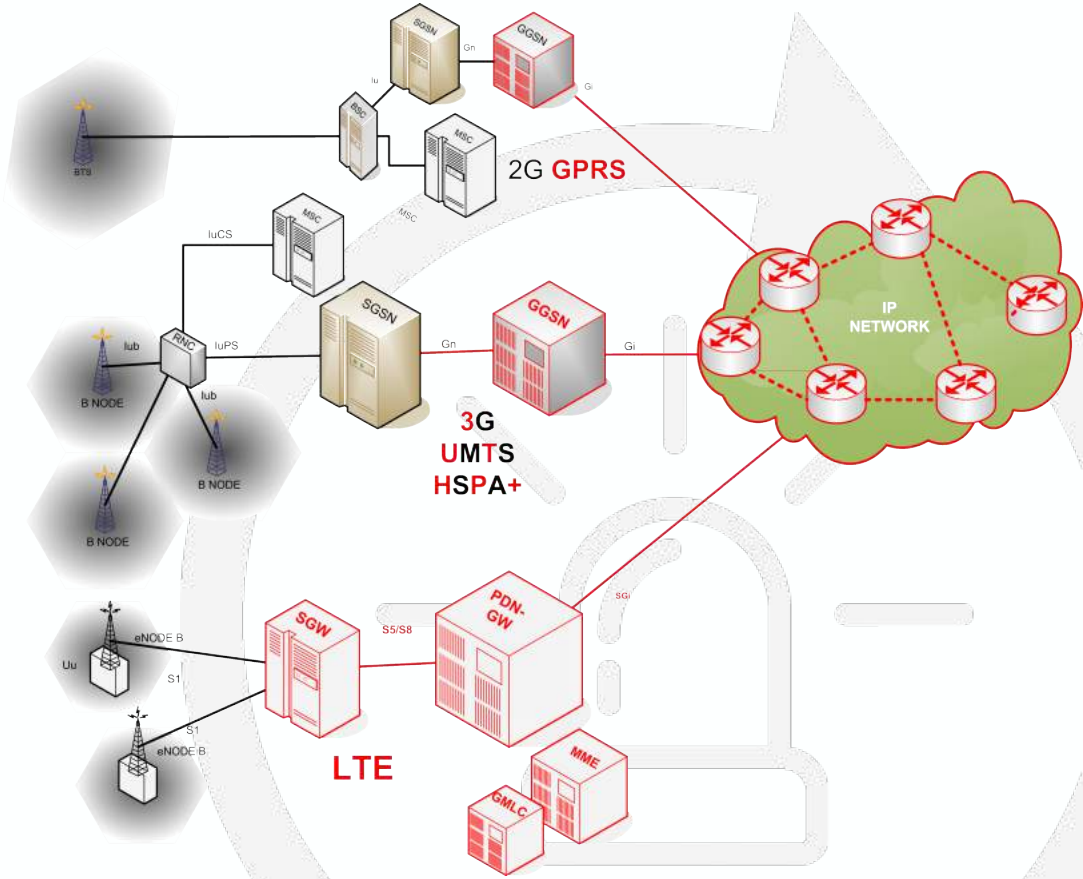


Would NG112 be “NG” networks friendly?

- Evolution of MVNO technology…

Towards All (Vo)IP, flat, uncoupled, IMS





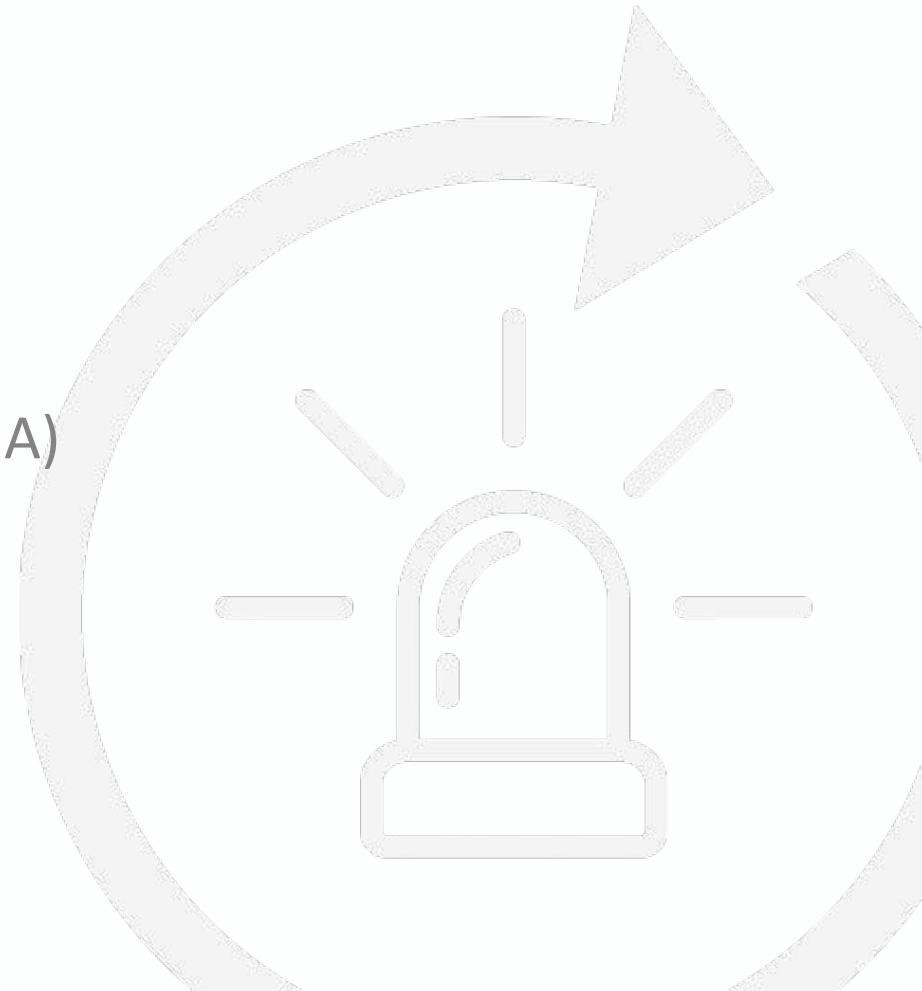
More NG112-ready than ever!!!

Conclusion 1: NG112 still on shape

- Most of the technologies on the NG emergency new landscape analysed are either fully NG112 compatible or can be integrated easily as originating networks
  - SIP/RTP+pidf-lo+MSRP everywhere
  - SBC issues should be considered specifically (i.e. with SBC vendors)
- Therefore, NG112 is still capable of accommodating new technologies
- Being IMS the most serious alternative the scope and requirements are still different considering the stakeholders involved
  - Although the business drivers might affect the future
    - All Telcos might easily move to IMS core in the short term but could PSAPs afford IMS cores just for internal (within ESINET) emergency call routing?

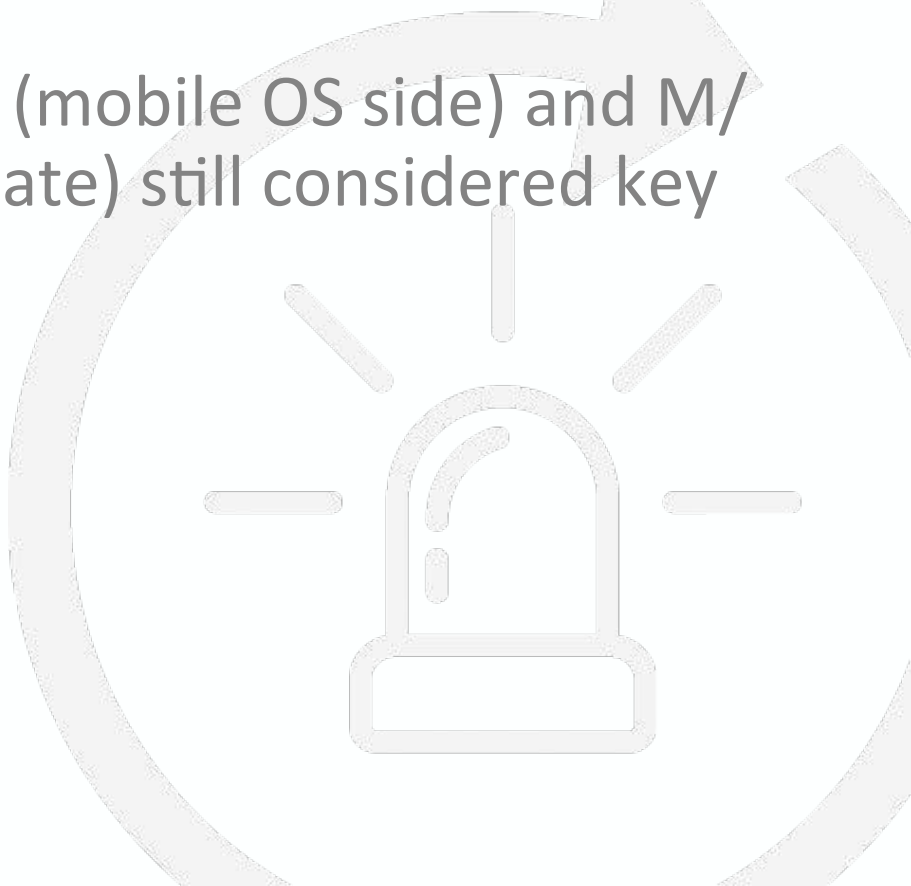
Conclusion 2: Need to raise awareness

- Target different stakeholders
  - NG112: PSAP community (EENA)
  - IMS: Telcos
  - SIPconnect: VoIP industry
  - eCALL: car industry + EC
  - M/493: EC
  - PEMEA: PSAP community and apps developers (EENA)
  - AML: telco’s, OS manufacturers



Conclusion 3: Sinergies

- NG112 should be included in the agenda of the ongoing next generation emergency networks and related initiatives (i.e. Smart Cities) in order to avoid reinventing the wheel
- Harmonization and “lessons learned” from AML (mobile OS side) and M/493 and eCALL (from harmonization to EC mandate) still considered key enablers for NG112 success



Recommendations

- AAA: Awareness, Awareness, Awareness + “Be water my friend”

Stakeholders	Actions
MVNOs (individual + organizations) Dev community	Raise awareness Who is responsible for what? External vs. internal EC routing vs. ESINET Exchange technical info “Howto”
New supranational Public Safety organizations/ evaluation testbeds	Integration of NG112/NG-9-1-1 Avoid reinventing the wheel Harmonization/Regulation initiatives
Big OS vendors	Lessons learned from AML
SDOs + debate on needs for standards	Keep pushing standardization efforts

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Questions/Comments to Cristina Lumbreras

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