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Proposal to review EU policy regarding Mission Critical telecommunications according to requirements for public safety communication

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This paper describes the need for the review of EU policy and regulation regarding mobile telecommunications, and the potential for infrastructure sharing for the delivery of Mission Critical applications/services, networks and devices. This paper provides a summary of work carried out by the BroadMap project which has studied the current Telecom Package of directive and regulations, NIS directive and other related materials.

No EU policy currently identifies the need for critical mobile applications, networks and devices for operation and roaming across all European countries. Each country and/or operator currently has its own discretion to define whether mobile services are considered as a critical information infrastructure or not.

Live EU Interoperable mobile systems are expected to be developed and released for use by PPDR responders within the 2025 timeframe. Now is the time for the respective regulatory bodies to begin to consider the sharing of critical information infrastructure over, or alongside, previously considered non-critical infrastructure. Infrastructure sharing must be analysed towards the aim of harmonising operation of mobile networks across Europe to achieve EU Interoperable broadband for 'life saving' public safety response.

Mobile communication applications, networks and devices are critical for the collaboration required in times of crisis or emergency. PPDR (Public Protection and Disaster Relief - Police, Fire & Rescue, and Emergency Medical Services) are highly reliant on coordination and communication while operating in the field. However, their technology is limited primarily to voice communication with only simple data services possible with current technology. Furthermore, each country typically deploys its own mobile networks dedicated for PPDR responders. These networks meanwhile are expensive and based on technology more than 20 years old.

The PPDR community is moving towards the use of 4G/5G mobile technology and large efforts have been made to include Mission Critical voice and data features into the global 3GPP standards for 4G and 5G.

To achieve an equivalent 'always available' operational performance as existing PPDR mobile technologies, it would be desirable again to implement dedicated 4G/5G infrastructure using dedicated spectrum. Despite their importance to underpin our citizen's safety and security, the number of PPDR users are relatively low and therefore dedicated systems are not considered cost efficient.

Furthermore, despite heavy lobbying and a positive response from WRC'15, it is becoming clear that Europe will not be able to realise a harmonised spectrum allocation for PPDR across all countries. Only a small number of countries have acknowledged the need for spectrum dedicated to PPDR use. European governments are, instead, becoming oriented by the revenue potential of next generation 5G mobile when considering such spectrum and auctioning it.

The likelihood of having to share commercial mobile telecom infrastructure to allow PPDR responders to use broadband mobile services is becoming ever

more a reality. Some countries have already begun to provide broadband services for their police, fire & rescue and emergency medical services, using existing commercial mobile networks. In the majority, broadband is currently used only for non-mission critical communications.

These early systems typically provide only the same reliability factors as our regular consumer smartphones. Coverage is mostly by population, and not geographical, yet crisis' can happen anywhere.

Live EU Interoperable mobile systems are expected to be developed and released for use by PPDR responders within the 2025 timeframe. The European Commission have funded project BroadMap (www.broadmap.eu) and a call is now open with 10MEuro funding for innovation activity towards the goal of producing a pilot system for EU Interoperable broadband for public safety by 2021/22 , with expectation for live use by 2025.

These new systems intend to allow public safety users to roam across borders, allowing highly efficient collaboration in times of crisis, wherever in Europe it may occur.

Whilst the harmonised spectrum argument for PPDR is mostly abandoned, harmonisation is still required across Europe to ensure that when a PPDR mobile user roams between different systems and different countries, that the reliability and availability of the service is consistently delivering 'always available' wherever the user is physically operating within Europe.

This is only achievable through regulation to govern that mobile infrastructure carrying Mission Critical services are implemented and operated to provide consistent levels of confidentiality, integrity and availability (CIA) across all European countries. 3GPP technical standards can only take this issue so far towards the implementation of interoperable products and services. For example, Priority and Pre-emption functionalities are standardised, allowing mission critical users to jump ahead of the resource queue over a consumer user. However, this is only implemented at the discretion of the mobile operator, and likely to be implemented as a premium priced service to mission critical users. New regulations are required to govern how infrastructure is shared for cost efficient and secure delivery of mission critical services; including how priority and pre-emption is handled for harmonised operation across Europe

On reviewing the NIS directive, which governs critical information systems, mobile telephony services are not explicitly included, and so not considered by default as critical information infrastructures. Consideration of mobile technologies providing a critical infrastructure is at the discretion of either the national regulator or infrastructure operator, therefore no EU wide harmonisation. Similarly, the Telecom Package of directives and regulations does not consider mobile communication applications, networks and devices that must deliver information at high levels of consistent confidentiality, integrity and availability.

New models of infrastructure sharing are being considered where public safety services may be overlaid across existing consumer mobile networks. In these models, it is difficult to see how the mobile operator(s) may consistently handle the critical nature of communications for public safety. Moreover, we have a new consideration of a 'virtualised' critical information infrastructure where the critical information aspects may not be secured by physically separate infrastructures. They will be virtualised functions, building upon new innovations in virtualisation and software defined networking.

The problem of regulating the sharing of critical information infrastructure over, or alongside, previously considered non-critical infrastructure, must be analysed towards the aim of harmonising operation of mobile networks across Europe to achieve EU Interoperable broadband for 'life saving' public safety response.

New considerations for pan European regulation are needed quickly, as many countries are ready to make decisions for the future of broadband PPDR communications, disregarding the European interoperability. These gaps in EU policy will make it difficult to mitigate issues arising from different commercial/public UE/national broadband implementations as they begin to become established within the next 5 years.

Recommendations

It is recommended that the following organisations review both independently and together to determine the most appropriate solution to safeguard our future mission critical mobile networks that are crucial to help save lives during crisis:

- Body of European Regulators for Electronic Communication (BEREC) ,
- European Union Agency for Network and Information Security (ENISA) ,
- European Commission - DG Connect, DG Home, DG Justice, DG Echo
- National Telecommunication Regulators of all EU Member States
- Members of the European Parliament
- PPDR Critical Communication Mobile Operators
- The PPDR End User community

It is strongly recommended that changes to the regulatory instruments should target:

- Appropriate additions to the Telecom Framework Directive
- Additional consideration of mobile critical information infrastructure (shared or otherwise) within the NIS Directive
- A possible new Directive or Regulation, solely to provide harmonised critical operation of mobile applications, networks and devices

We strongly recommend that regulatory organisations take the recommendations presented throughout this paper into consideration, and support Europe's PPDR organisations by implementing solutions with the objective of making our First Responder's communications "first" in confidentiality, integrity and availability, as First responders require the best communication tools to help them to safeguard our citizen's lives.



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