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FRENCH ROADMAP

PPDR Broadband LTE

6 April 2017

Brussels



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PPDR networks

Requirements

Industrial context

Broadband PPDR

QoS & security

Remaining issues

Agenda

- PPDR Networks in France today
- Requirements
 - Coverage, Crisis management
- Industrial context renewal
 - Interoperability
 - Shorter term contracts
- Broadband PPDR networks a plan towards 5G
- New issues: QoS and security
- Remaining issues



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PPDR Networks today

- TETRAPOL networks (shared terminals)
 - RUBIS 80 MHz for gendarmerie 80 000 users
 - INPT 400 MHz for police and fire brigade 150 000 users
 - Coverage 45% territory hand-held ; 85 % vehicles
- NEOGEND and NEOPOL (individual terminals)
 - Secured access to professional databases and apps through commercial networks (3G and 4G)
- Already a hybrid model
 - Two terminals with two different technologies and costs
 - Access to broadband on commercial networks
- Legacy technologies
 - TETRAPOL TDM support breaks up in 2020
 - TETRAPOL IP support breaks up in 2035 (?)
 - Only voice and (very) narrow band data



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Requirements

- Users Requirement : **NON REGRESSION**
- Workshops to determine the needs
 - 25 points of decision
 - Governance (6)
 - Organization (5)
 - Financial (3)
 - Functional and technical (8)
 - Perimeter (3)
 - ✓ Geographical
 - ✓ Operator responsibility
 - ✓ Users responsibility
 - An agreement on a list of requirements
 - Some points will be studied in further workshops
- A 5G ready network



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Functional Requirements

- MCPTT with dynamic conference management
- MCVideo
- High data rate access for applications
- Connection with PSTN
- Border interoperability
- Interoperability with private PPDR organizations (red cross...)
- 98% territory coverage, indoor included
- 99,99% coverage availability
- 99,999% availability for MCXXX applications
- Permit access to MCXXX applications in areas out of coverage between terminals
- Permit traceability and record of all kind of exchanges using the network



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Constraints

- Budget
- The standards and only the standards
 - Avoid manufacturer fallback modes
- Direct mode/ProSe versus IOPS/tactical networks
 - Direct mode is considered as a functional requirement by some users
 - ProSe doesn't completely meet the need, 500 meters range is not enough
 - IOPS/tactical networks operational use to be checked
- The french law on telecommunications needs some improvements for MNO to reach our purpose
 - Multi MNO roaming
 - slicing



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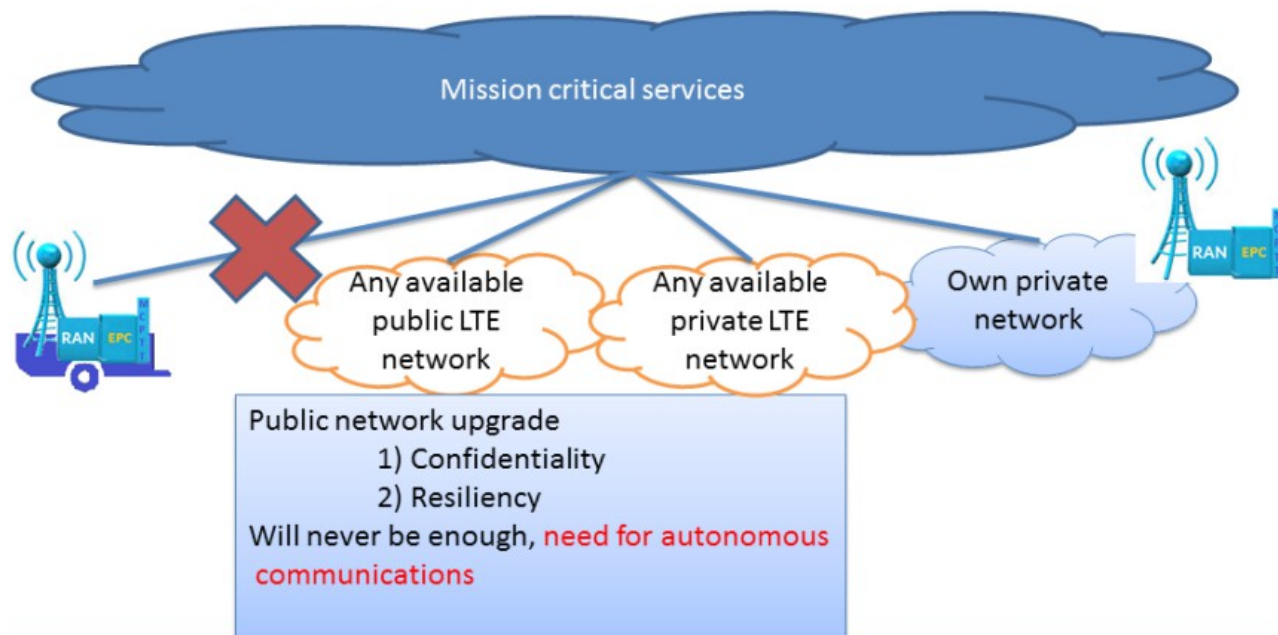
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Architecture to meet the need



Same user interface for day-to-day and « crisis » mode



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New Industrial context

- Benefit from latest technologies for critical communications users
 - Quick access to MCXXX multimedia services
 - 5G functionalities as soon as available
- Taking benefits from commercial telephony and 3GPP standards
 - New comers in CC world: operators, commercial telephony manufacturers
 - Leverage large commercial markets to get cheaper equipments and more services
 - Reuse commercial technology lower layers
- A living and efficient Critical communications industry
 - Producing products with real added value
 - CC specific services
 - Autonomous in crisis
- A more dynamic ecosystem
 - Shorter contracts
 - Multi vendor infrastructures based on stronger standards



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The Roadmap towards 5G

- Legacy 2013-2016 actions in the standards (3GPP)
 - MCPTT, ProSe, IOPS
 - Enhance ProSe range (tactical networks)
- Present 2017-2021 Storm project
 - Tactical networks for intervention forces
 - Operational and proof of concept
 - For industry: A trial for 5G and vertical markets
- 2018-2019
 - Operational, technical and financial feedback
 - First procurement for infrastructure roll out
- 2020...
 - Roll out of an hybrid network
 - Ready for 5G functionalities
 - Pilot project on field: countryside, small town and city



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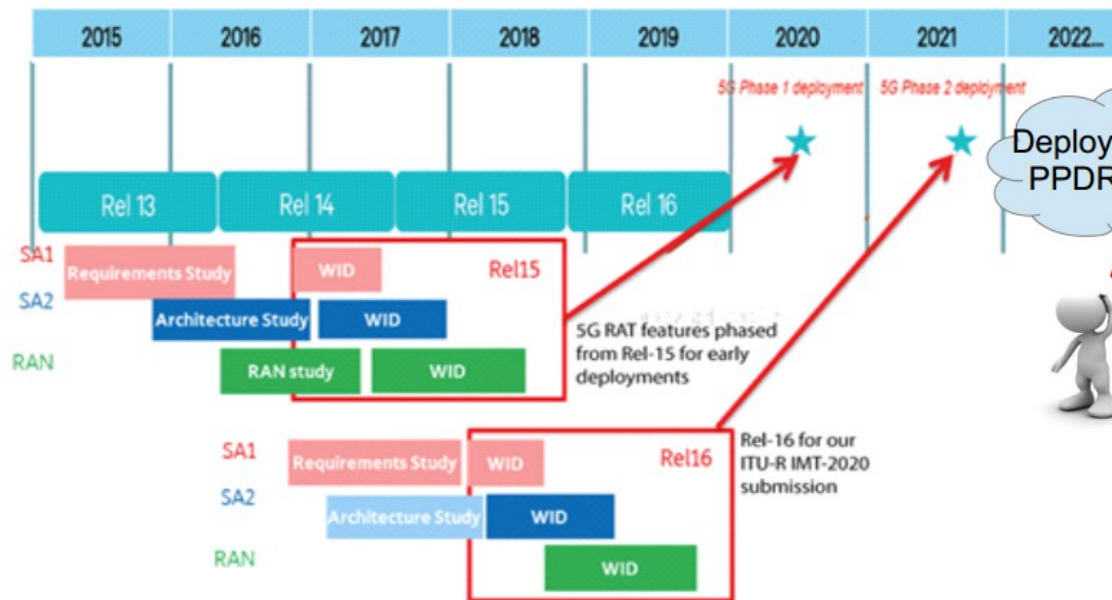
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5G Roll out in 2021 ?

5G expectation in second phase



3GPP 5G Roadmap



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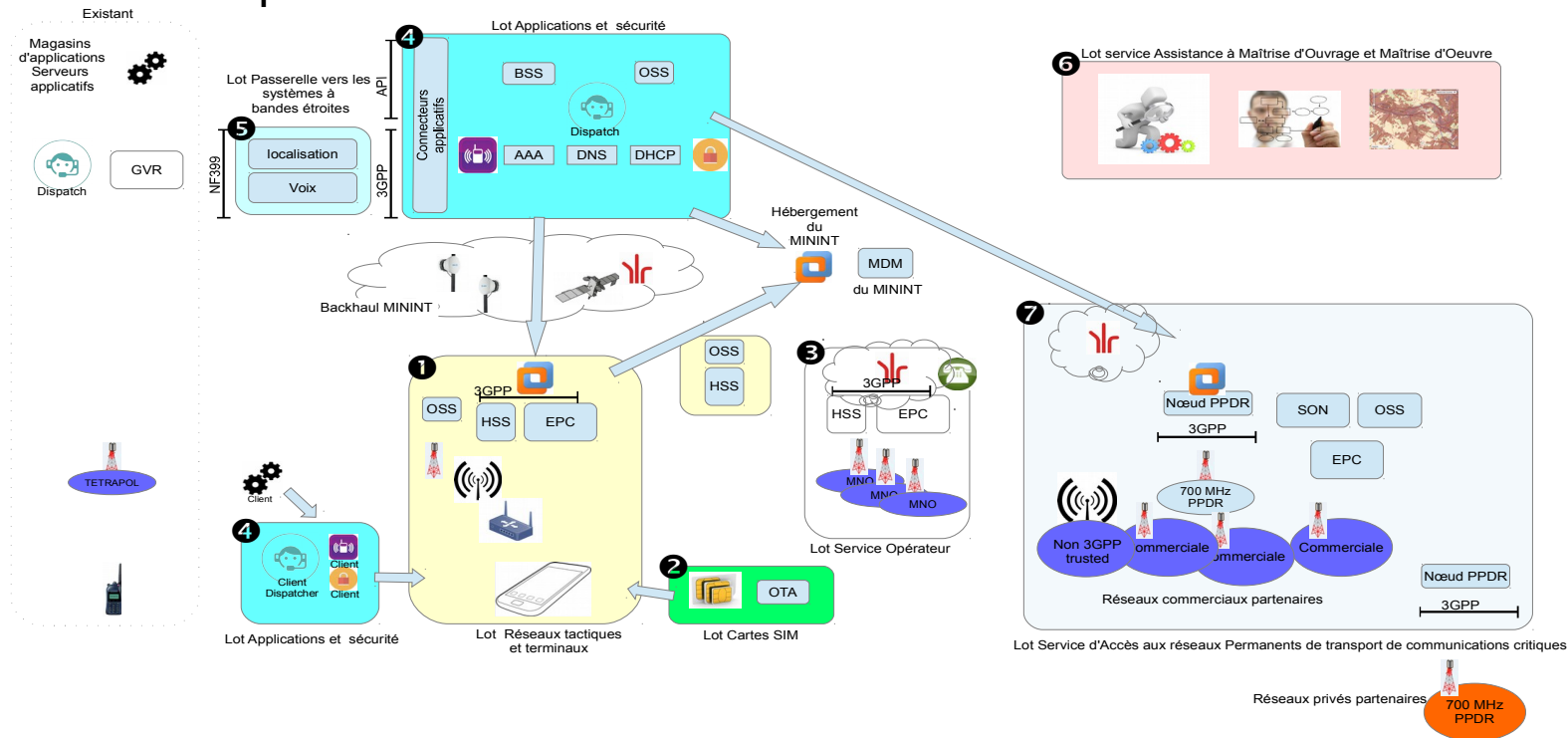
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PC STORM Project : the first step in LTE technology

- Tactical network for intervention forces
- 7 lots in procurement





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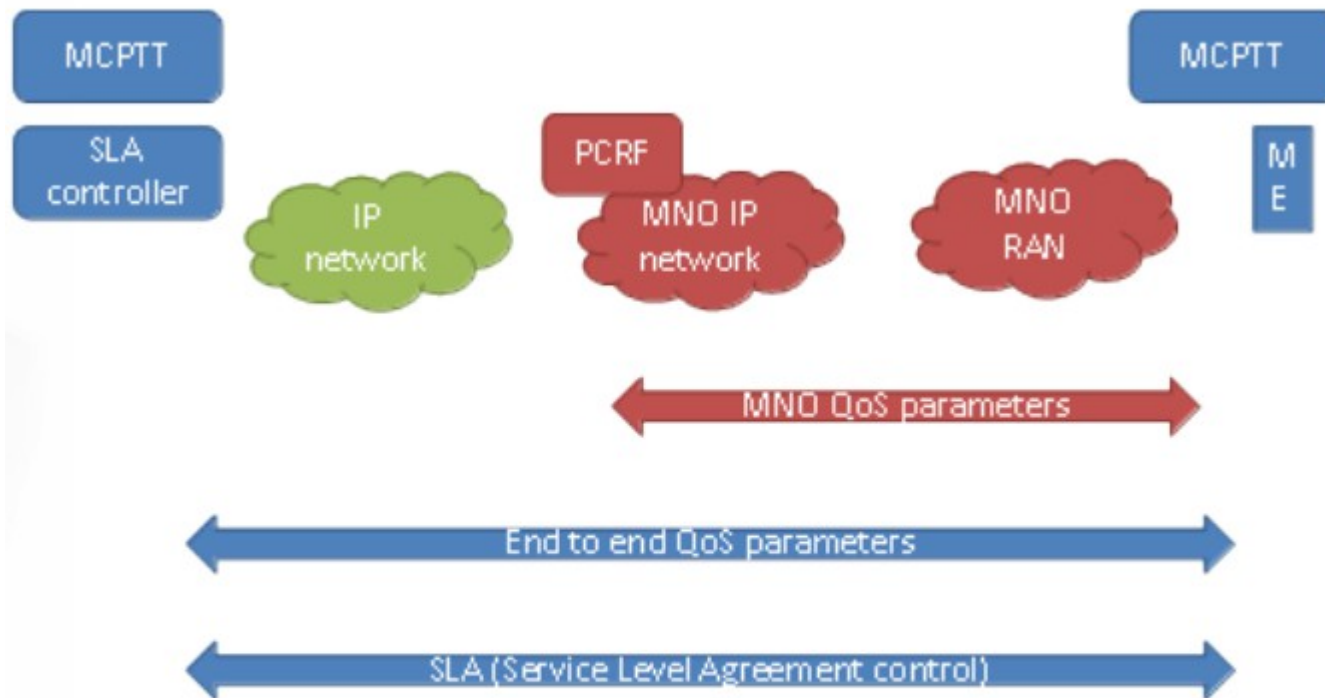
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End to end QoS with MNOs



To control MNO parameters, we need to ensure the IP network is not limiting



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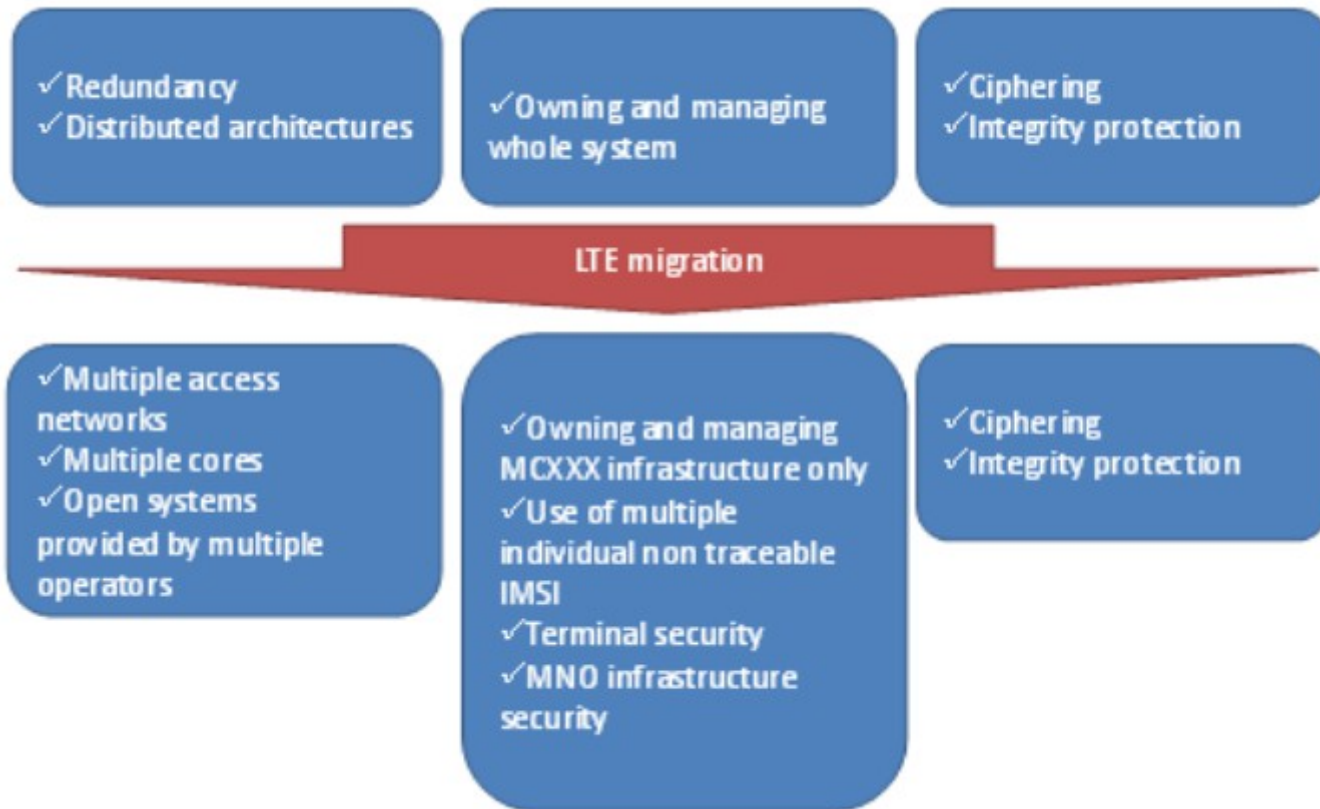
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Security





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Remaining issues

- Architecture
 - Resiliency for RAN, HSS, MCXXX
 - 5G
 - Virtual network
 - New services (but with which frequencies?)
- Operational feedback
 - Direct mode vs ProSe vs tactical networks
 - Use of multimedia services on field
- Interoperability
 - Between MCXXX servers (ETSI's leading on a good way)



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Remaining issues

- Business models
 - Price of band 68 (terminal and infrastructure) ?
 - Use of the small slice of band 28
 - Cost of frequency sharing
 - Which bandwidth ?
 - Regulation or commercial agreement ?
 - Cost of ProSe (in band 68, 28, others ?)
 - Cost of tactical networks
- Challenge TCO (including HR) of dedicated and operated networks
 - RAN sharing vs QoS control in roaming
 - 100% dedicated (legacy)
 - Dedicated networks in sensitive/uncovered areas with tactical networks infrastructure



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