



Broadband public safety communication

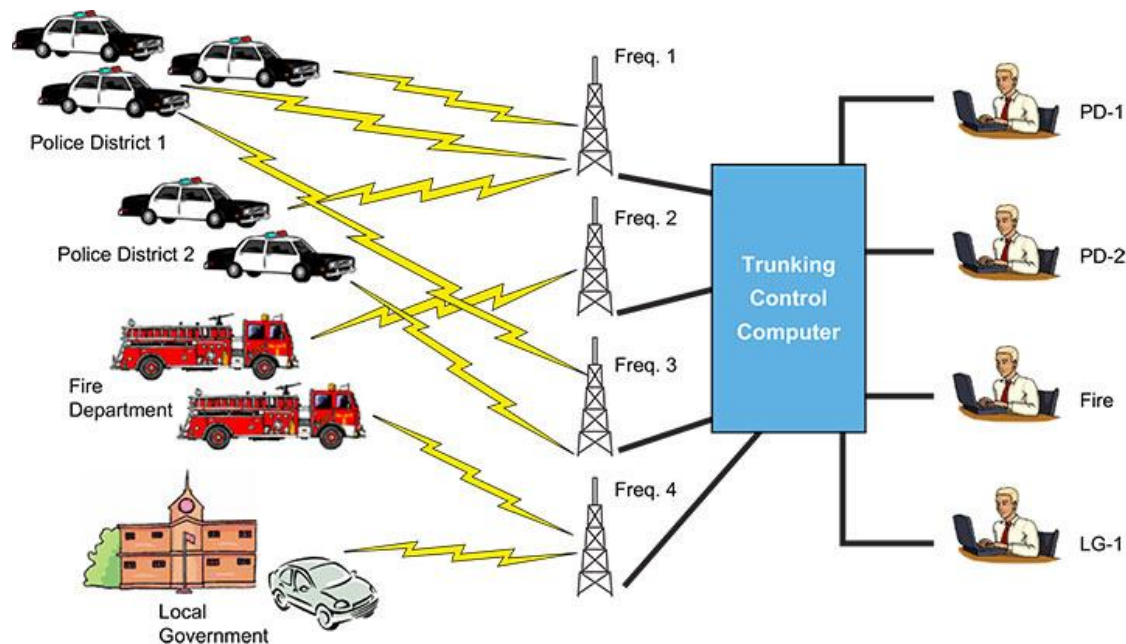
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What is Public Safety Communications

- ❑ Communications used by Law enforcement agencies, Fire, Medical Emergency teams etc
- ❑ Emergency Warning or Public Warning Systems
- ❑ Public Safety and Disaster Recovery
- ❑ Critical Communications



Public Safety Communications - Uniqueness



- ❑ Mission Critical
 - ◇ Reliable, resilient and secure
- ❑ Challenging Working environment
 - ◇ Robustness
- ❑ Immediate connectivity and communications within selected groups
- ❑ Push-to-talk
- ❑ Group Communications
- ❑ Direct mode - peer to peer - communications
- ❑ No congestion / blocking issues
- ❑ Priority management; Dynamic QoS
- ❑ Positioning, Maps & Location
- ❑ Security

Communication Systems used today

- ❑ PMRTS – Analog and Digital
 - ❑ Analog
 - ◇ APCO
 - ❑ Digital
 - ◇ APCO 25
 - ◇ TETRA
- ❑ State Police in India use HF/VHF sets for communications
- ❑ Narrowband systems
- ❑ Primarily Voice



Technologies of Today

TETRA



- ❑ Circuit switched voice and narrow band data services
 - ◇ 9.6 kbps
- ❑ 4 channels of 25 KHz
- ❑ TEDS offers 80 kbps in 50 KHz channel
- ❑ ETSI standards
 - ◇ Europe



APCO 25



- ❑ TIA US standard
- ❑ FDMA 12.5 KHz channel
- ❑ 2 channel (6.25 kHz) TDMA
- ❑ Like TETRA, circuit switched voice

Why are existing systems insufficient

- ❑ Not designed to support higher bandwidth requirements
- ❑ Limited capabilities
 - ◇ Primarily voice
 - ◇ Limited video or images
 - ◇ Limited data services
- ❑ Legacy systems, Earlier generations
- ❑ Inter-agency communication through civilian networks
- ❑ Interoperability issues between different agencies
- ❑ Spectrally inefficient technology
 - ◇ Analogue systems
 - ◇ Inefficient digital technologies

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Not Broadband enough! No Evolution!!

Current Needs of Public Safety systems

- ❑ Broadband systems for public safety
 - ◇ Carry multiple low to high speed traffic at mission critical performance
- ❑ Video
 - ◇ If Real time video surveillance was available during 26/11!
- ❑ Economies of scale
- ❑ Transitioning to broadband wireless for public safety
 - ◇ Ex. US National Broadband Plan , US defense
- ❑ Interoperability between different vendors' solutions
- ❑ Spot frequencies assignments to be reviewed considering the overall needs & architecture of PSDR

LTE for Public Safety Communications

LTE capability, reach and costs
attractive to Public Safety users



National Public Safety
Telecommunications
Council



TETRA and Critical
Communications
Association



ETSI Technical
Committee on TETRA



Requirements and Inputs



Maximize commonality between commercial and public safety aspects

Developments in LTE specs for Public Safety

❑ Done in Rel12 (2013-15):

- ◇ Proximity services (ProSe) and Device-2-Device (Direct Mode)
- ◇ Group Commn System enablers – Baked in to LTE or Application servers based
- ◇ QoS for mission critical services

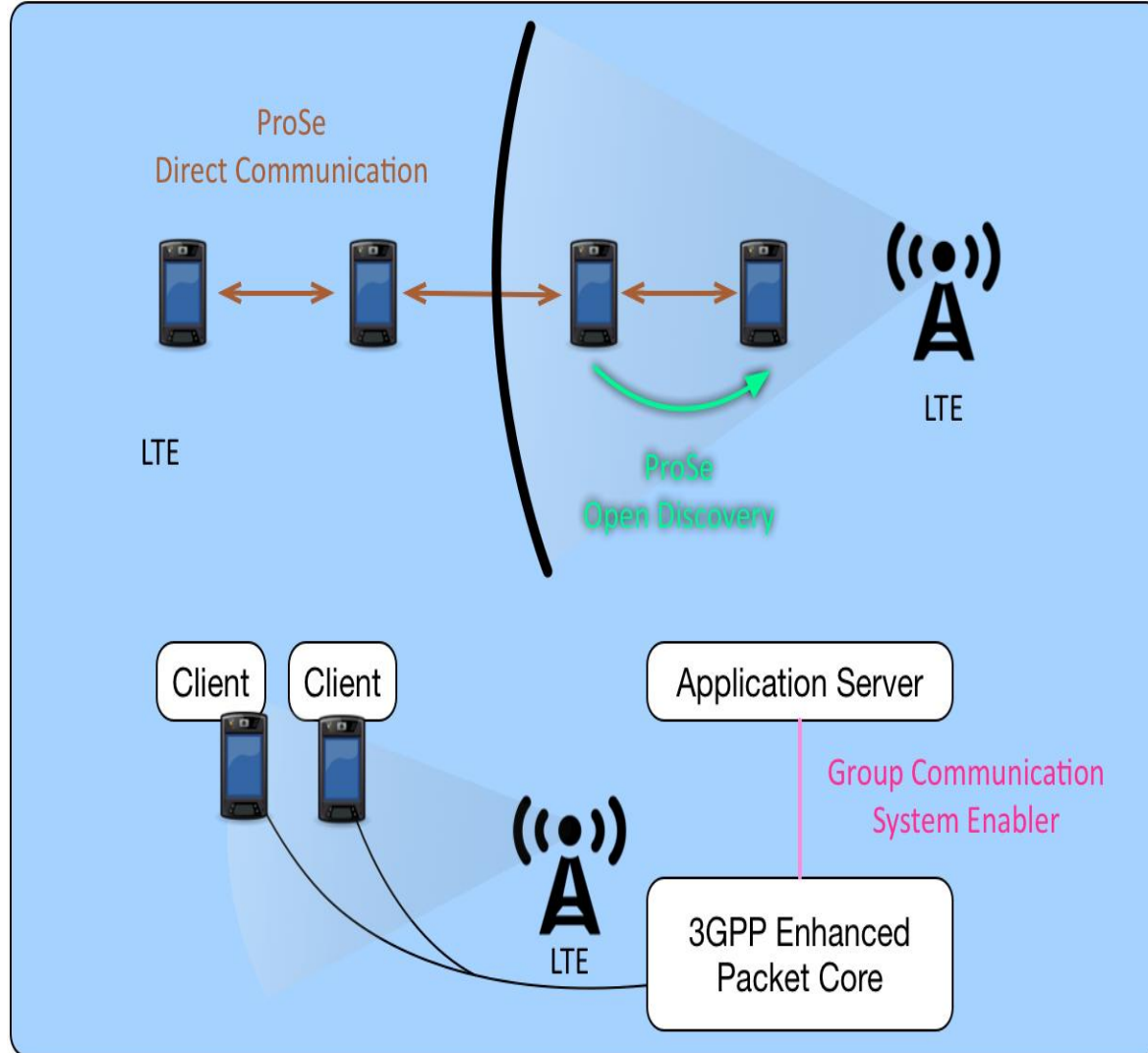
❑ New in Rel13 (2014-16):

- ◇ Proximity Services - Direct Discovery, UE Relay
- ◇ Mission Critical Push To Talk (MCPTT)
- ◇ Isolated E-UTRAN Operation
- ◇ MBMS Enhancements

❑ Planned in Rel14 (2016-):

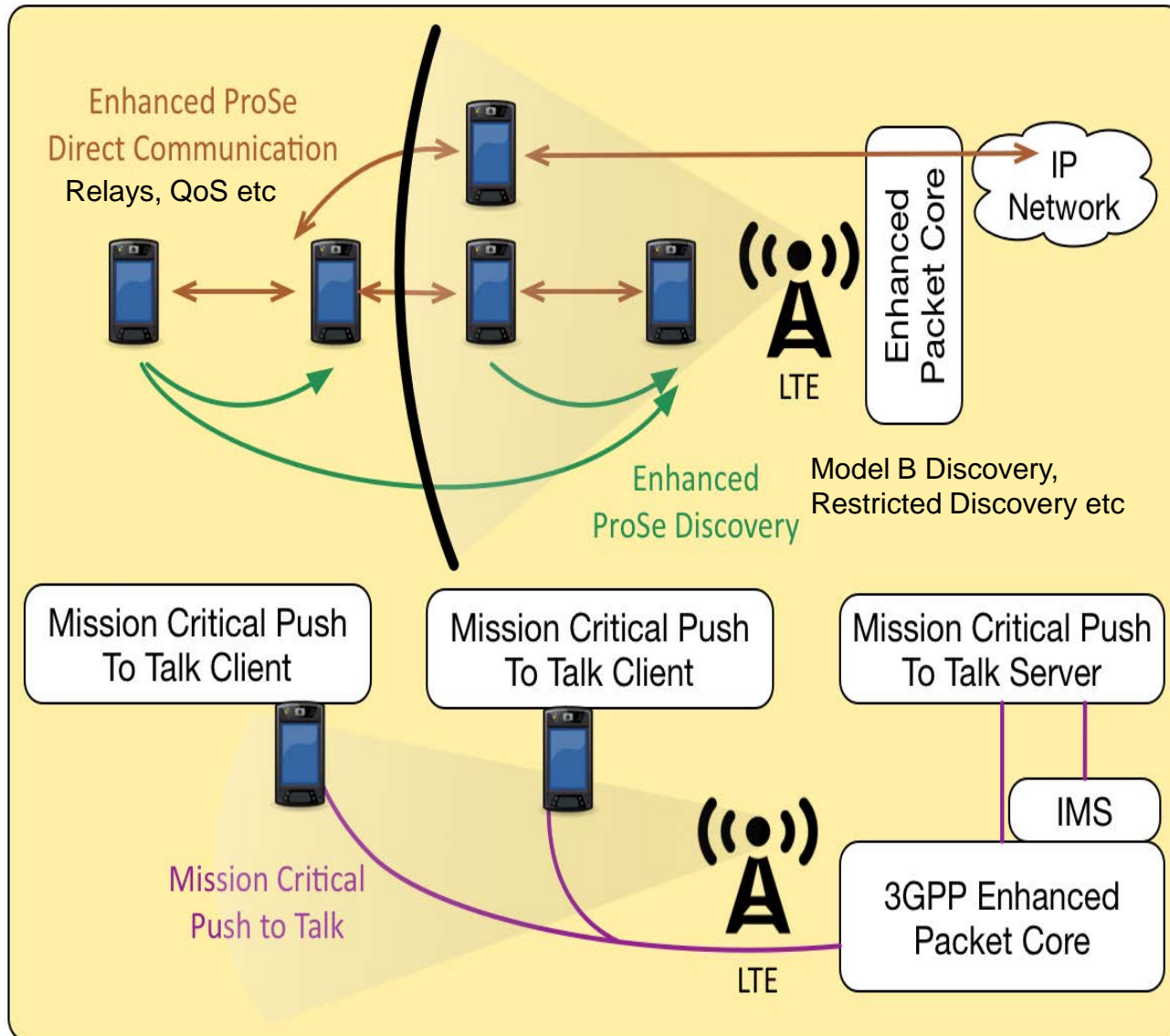
- ◇ Mission Critical Video & Mission Critical Data Application

Release 12 Standards Related to Public Safety



Courtesy: GSC-19_101 by Erik Guttman

Release 13 Standards Related to Public Safety



Courtesy: GSC-19_101 by Erik Guttman

LTE for Public Safety

Metric	Current PSDR	LTE (4G) based Emergency Response System
Cost	High	Significantly lower
Speeds	Low (max 115 kbps)	High (max 75Mbps)
Transport Technology	Narrowband and circuit switched	Broadband and IP based
Security models	Primitive – easy to intercept	State of the art
Services	Voice, SMS	High fidelity Voice, SMS/MMS, high quality video, Data, future proof for all IP services.
Capabilities	Group communications, Direct mode operations, interface with SwMI	Meets the capabilities of current PSDR systems

Future of Public Safety Communications

- ❑ Availability of sufficient bands and their harmonization
- ❑ Device to Device / Peer to Peer using Next Gen technologies
- ❑ Compatibility with Civilian networks
- ❑ Future of TETRA ??
- ❑ Harnessing telecom networks to provide support in disaster situations (NTP 2012)
- ❑ IoT Wearables!?

THANK YOU

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