



3GPP's progress in delivering interoperable LTE Public Safety Standards

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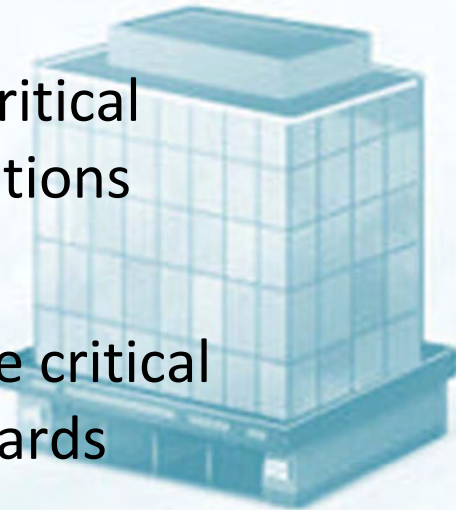




Introduction



- 📶 Standards used for commercial cellular and critical communications have historically been separate
- 📶 New interest today in adapting LTE for critical communication and public safety applications
- 📶 3GPP is working in collaboration with the critical communication industry to deliver standards








Commercial cellular



Benefits of vast success:

-  Huge R&D investment and innovation
-  Economy of scale
-  High speed, multimedia

But:

-  Not optimized for Public Safety



Public Safety/Critical Communications



Etc,...

Features:

- 📶 Robust
- 📶 Excellent group operation
- 📶 Priority control
- 📶 Direct mode

But:

- 📶 Expensive due to limited volume
- 📶 Slower evolution than commercial cellular




Commitment to LTE



National Public Safety Telecommunications Council




 Spectrum and US\$7bn funding for LTE-based national US public safety network at 700MHz

 Started standards process in 3GPP

Tetra + Critical Communications Association



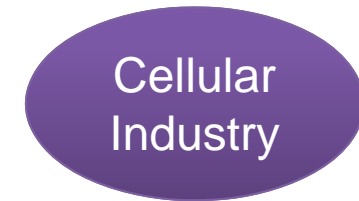
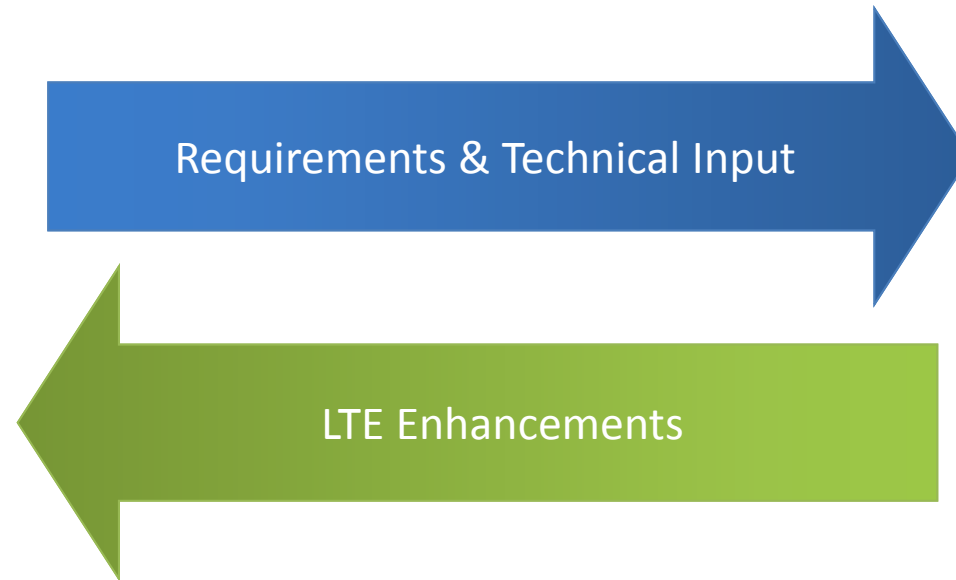
 Committed to LTE for broadband critical communication systems

3GPP Cooperation



📶 Preserve strengths of LTE while also adding features needed for public safety

📶 Maximise the technical commonality between commercial and public safety aspects



Striking a balance – the sliding scale



More COTS technology reuse

Lower costs

Faster standardization

Less delivery risk



More operating modes supported

Performance (KPI) improvements

Better support for “difficult”
radio situations

?



Public safety scope in 3GPP



System Features

Proximity services (ProSE)
Group call on LTE enablers (GCSE_LTE)



Radio Layer Features

Frequency band support
Power level support
Radio enablers for system features

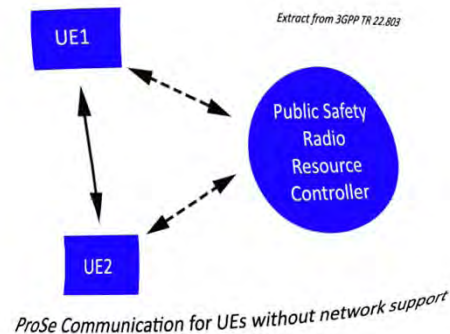
Proximity services objectives



Allow devices in close proximity to communicate directly

- Reduce network load
- Increase capacity in given bandwidth
- Allow communication in areas without network coverage

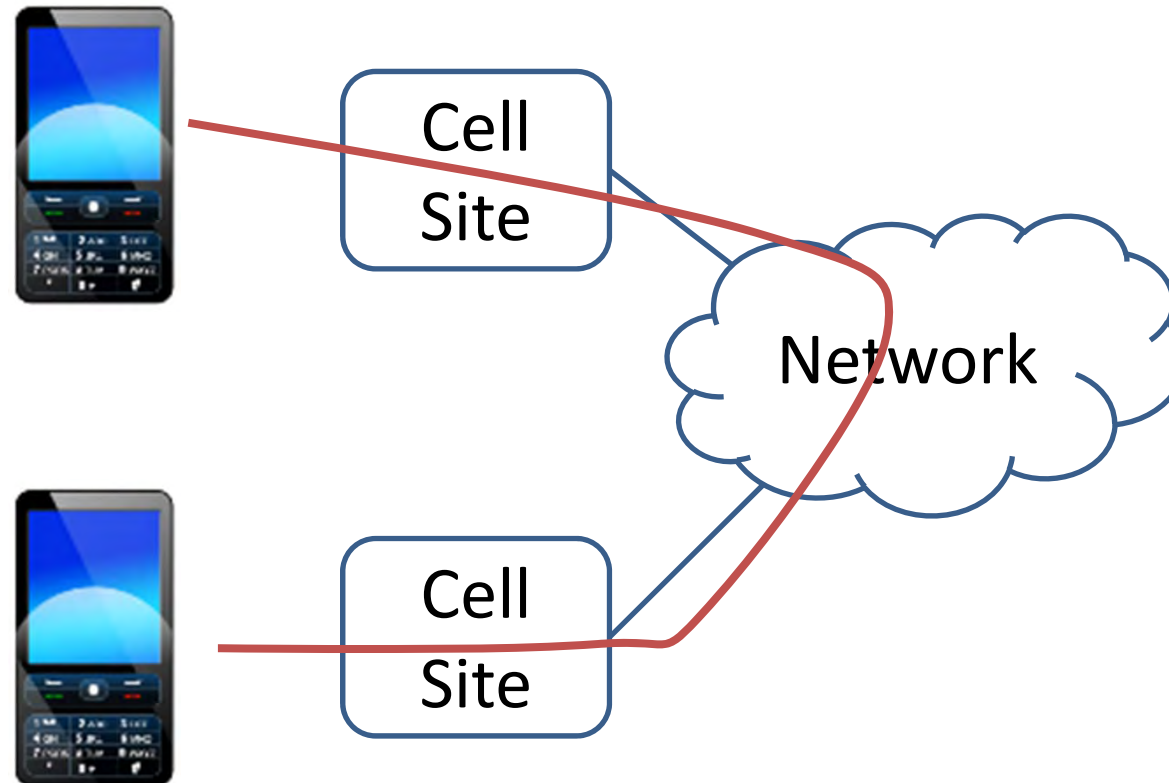
} Also interest for consumer applications
} Public safety only



From 3GPP TR 22.803

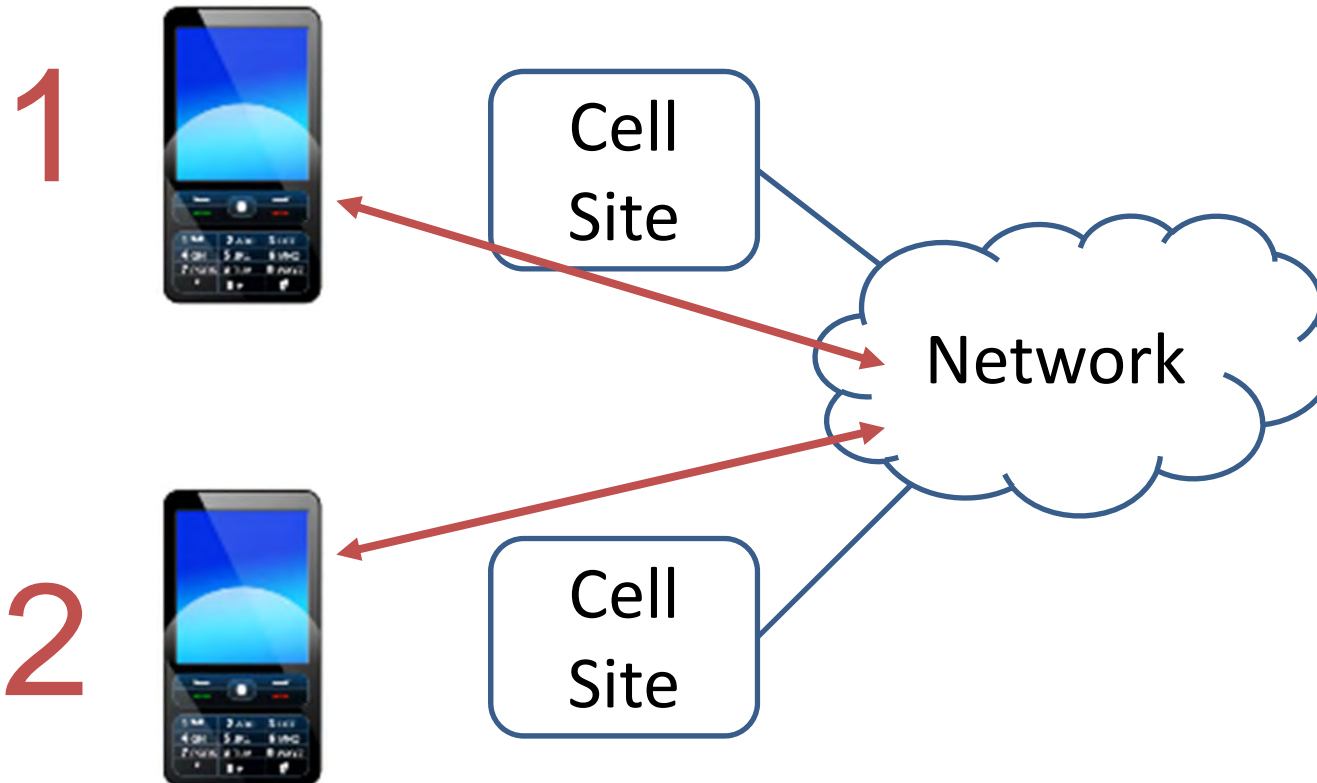
Proximity services (ProSE)

Current LTE Communication Path



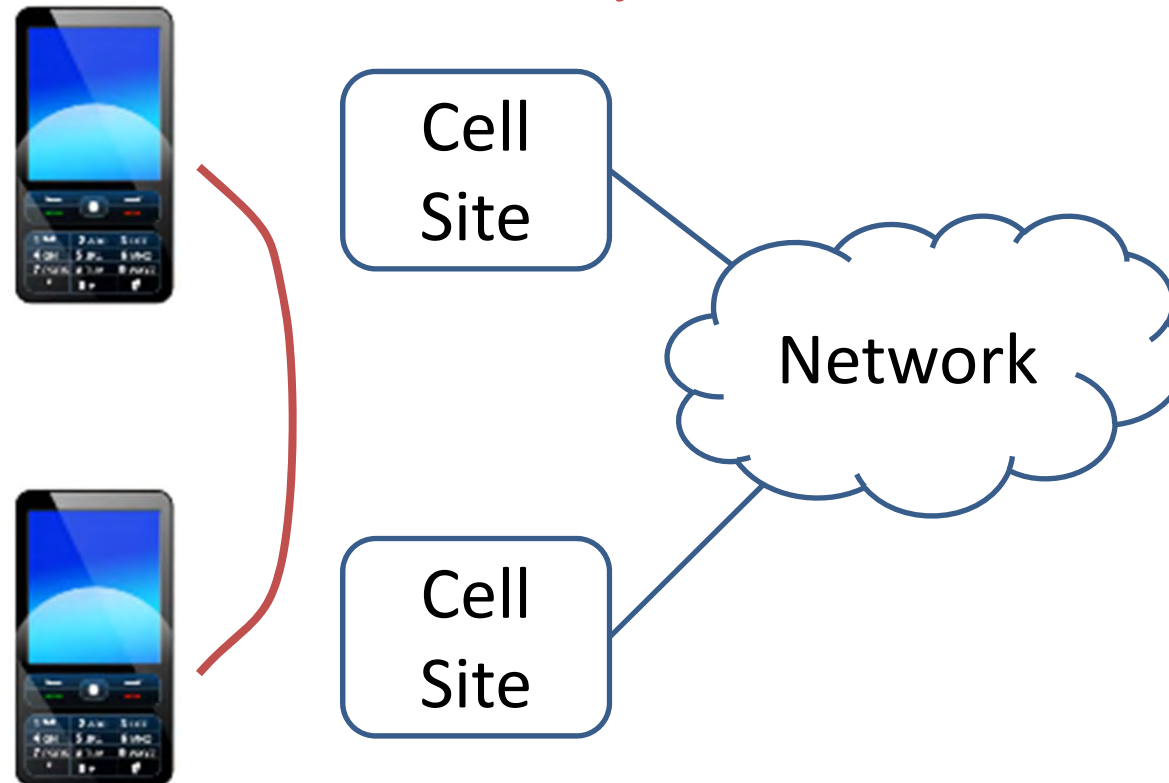
Proximity services (ProSE)

Network Assisted Discovery



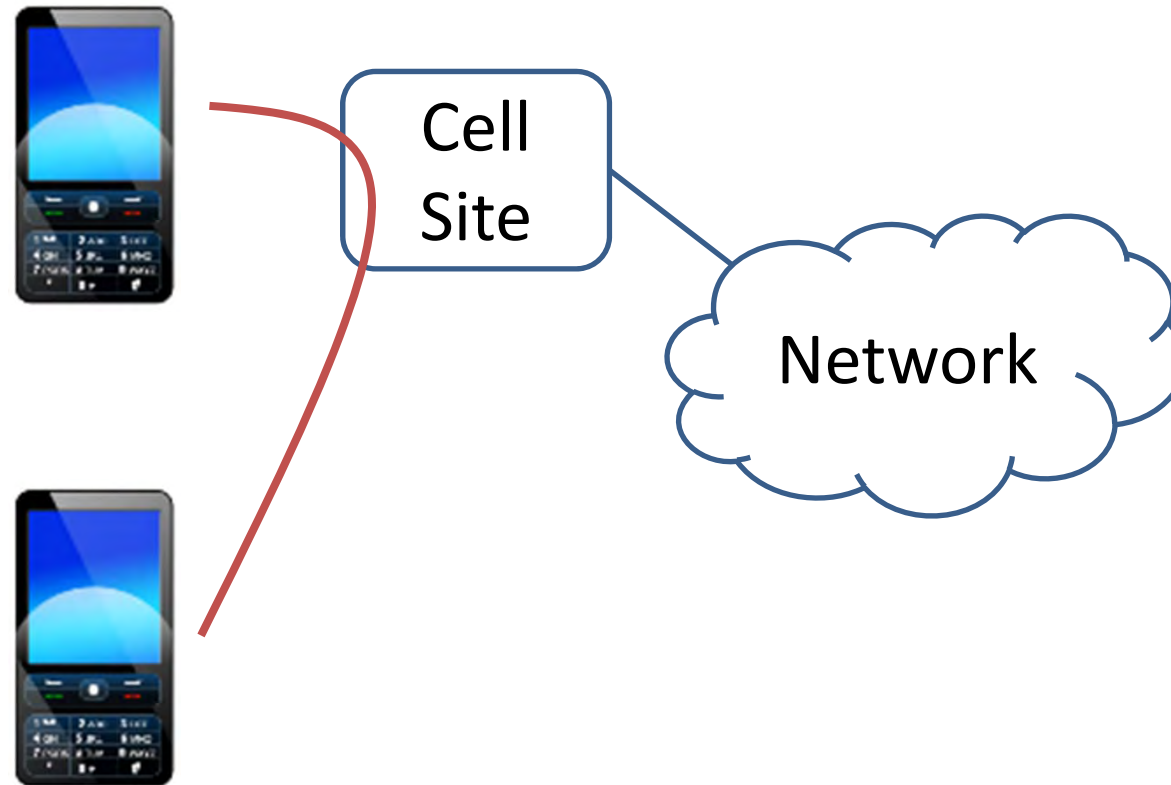
Proximity services (ProSE)

Direct Communication with Proximity Service



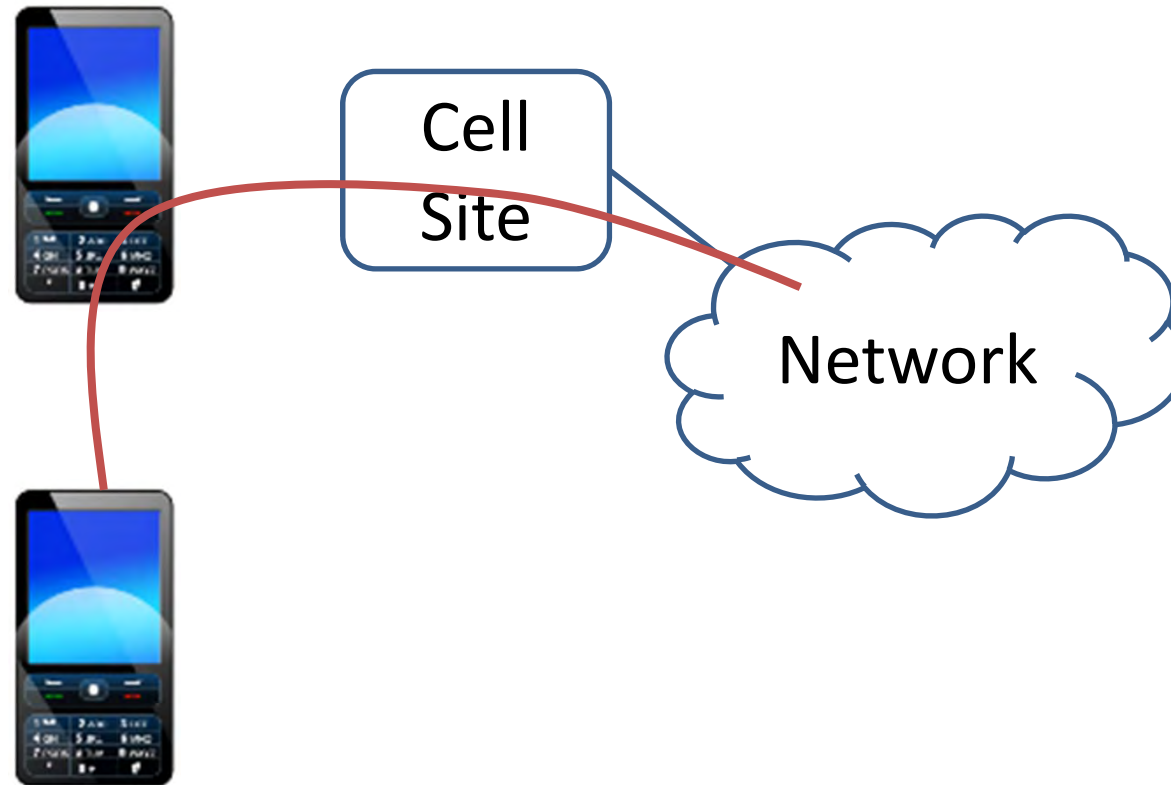
Proximity services (ProSE)

Locally Routed Communication with Proximity Service




Proximity services (ProSE)

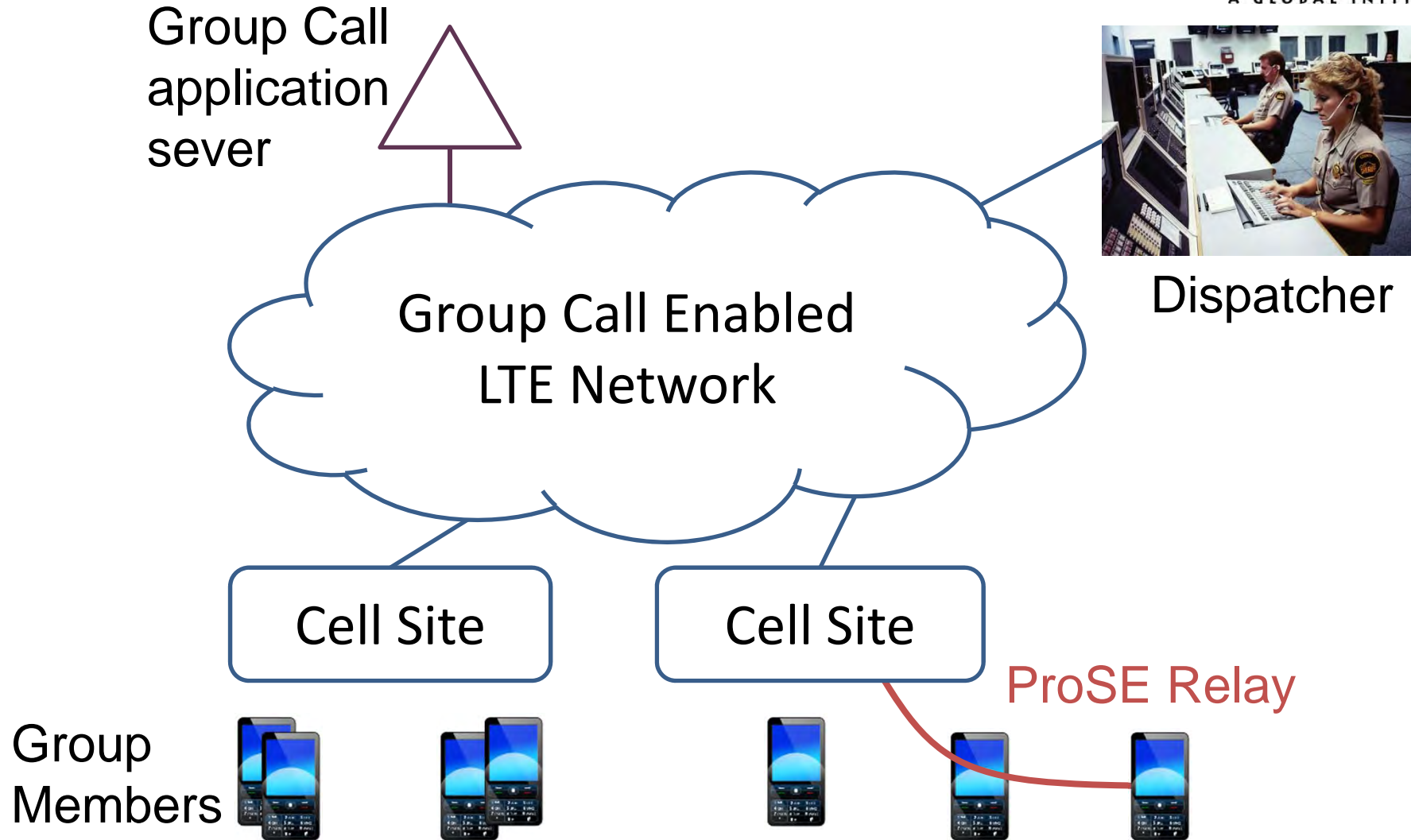
User Equipment to Network Relay



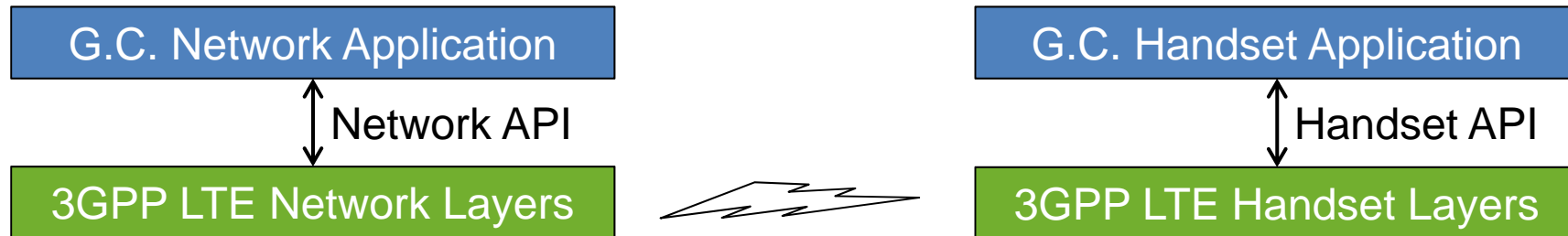
Group call enablers objectives

-  Enable efficient group communication
 - Dynamic groups with mobile users and dispatchers
 - Support for floor control (eg push to talk mode)
 - Large groups (perhaps up to 5000)
 - Low latency to add users, obtain channels

Group calling



Group call application/enabler split



📶 Split between application and LTE layers still being developed.

Proposals:

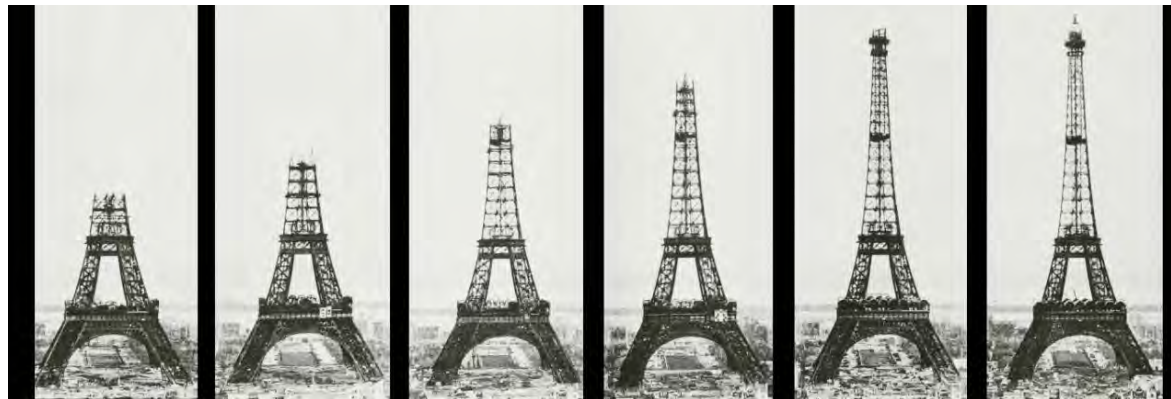
- Application layer: service behavior and control
- LTE layer: mobility and radio
- Joint: performance, service interaction

📶 What is API protocol?

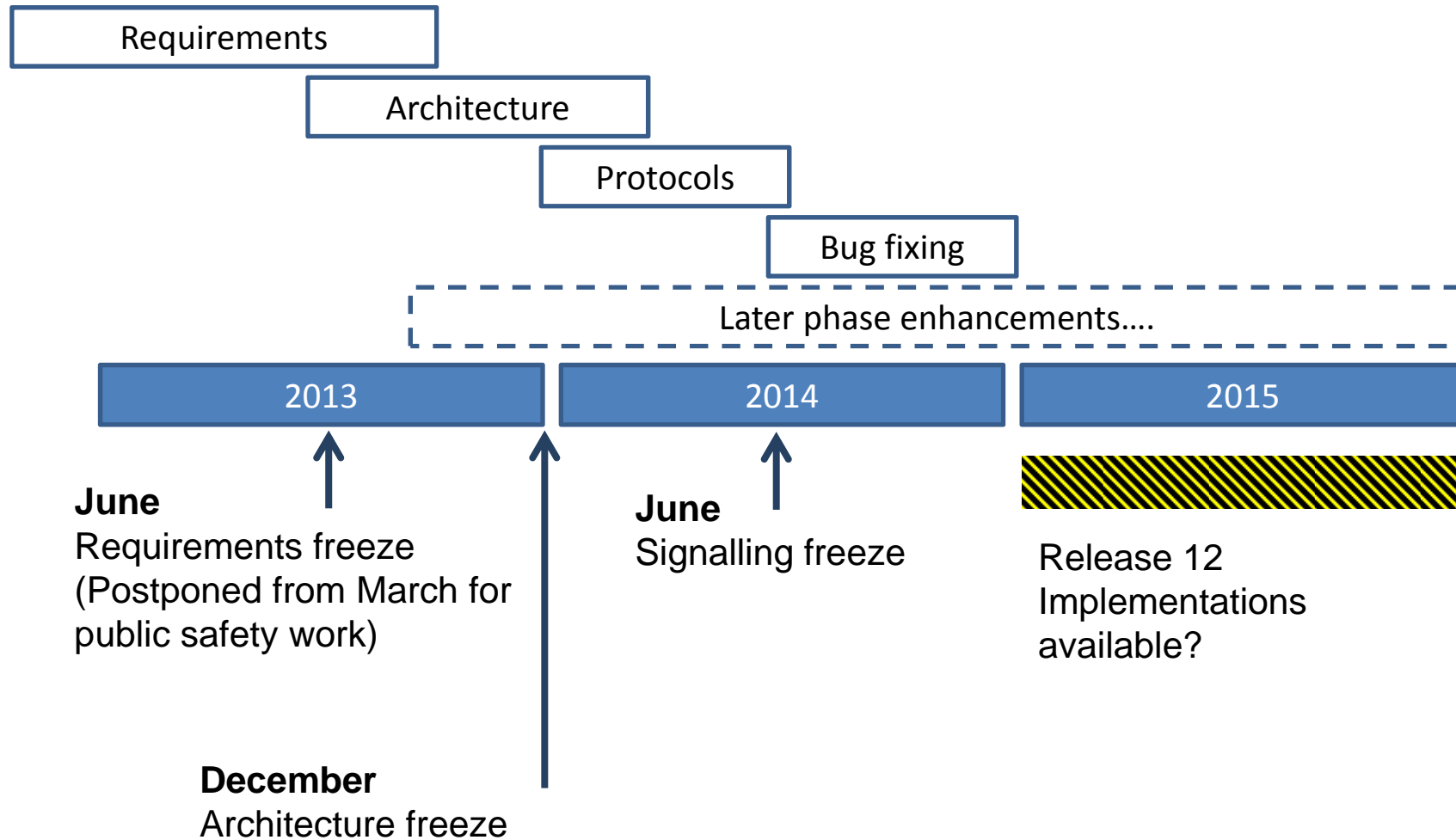
3GPP Phasing



- 3GPP Standards releases last 18-24 months
- Major work items typically span several releases
 - Deliver minimum viable solution and enhance later
- Anticipate that public safety will span more than one release



3GPP Release 12 roadmap

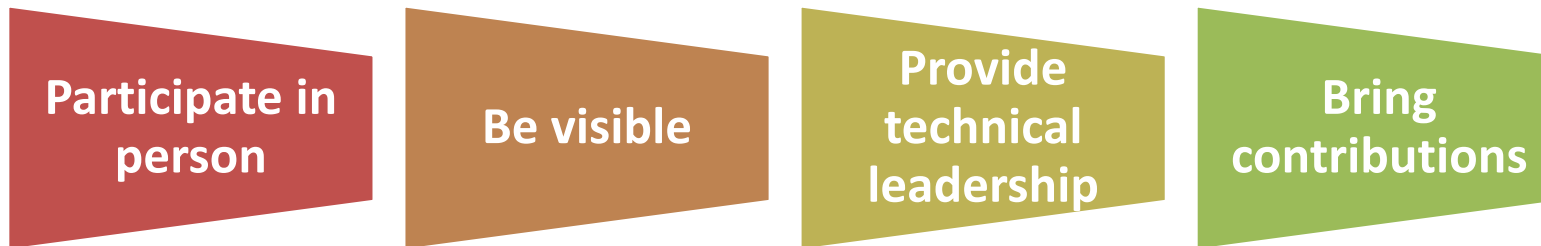


Migration and legacy interworking

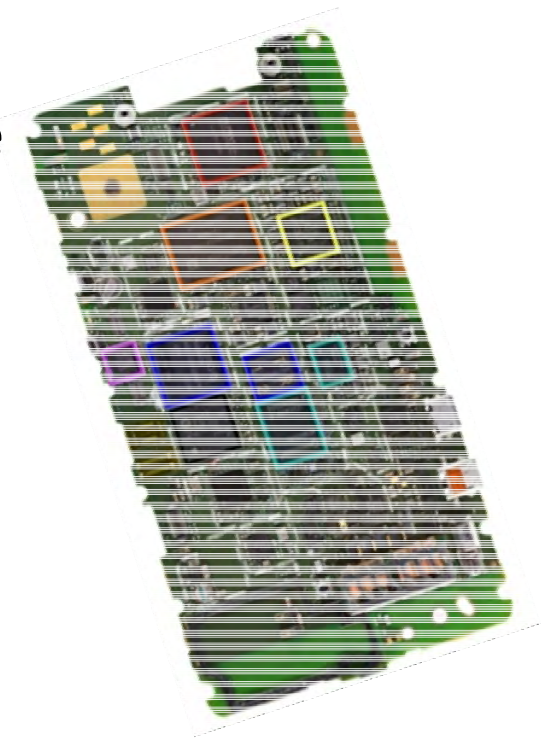


- 📶 Commercial cellular industry has strong requirements on smooth technology migration and interworking
 - The tighter the legacy interworking the more costly/complex the system
- 📶 Migration requirements for LTE Public Safety need to be carefully considered
 - Common groups
 - Voice migration/co-existence
 - Handset capabilities

Public Safety community role in delivering LTE standards



- 3GPP needs your physical presence and active participation
- Ensure LTE technology re-use
- 3GPP must balance priorities of all members
 - Contributions drive the work



Work beyond 3GPP

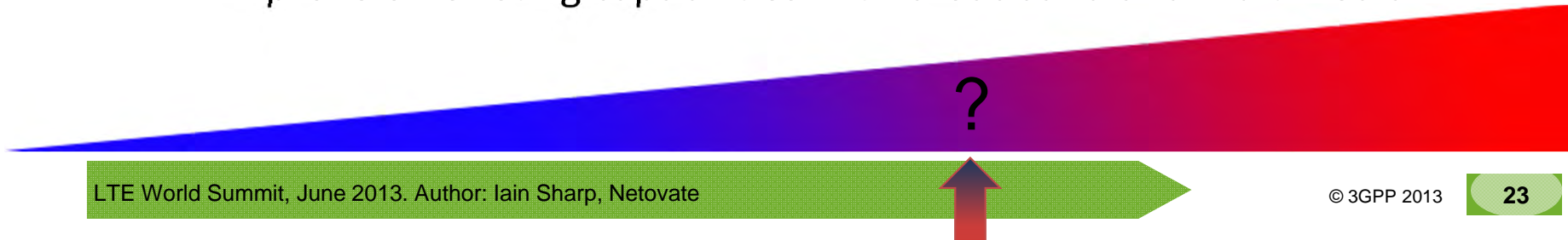


- 📶 Standards are one element in enabling a market
 - 3GPP will deliver LTE enhancements for public safety in Release 12
- 📶 Potential users need to also consider:
 - Spectrum
 - Regulation
 - Application designs
 - Legacy coexistence and migration strategies
 - Handset and infrastructure ecosystem

Conclusion



- 📶 3GPP has started work on public safety standards
 - Meet market needs in an interoperable manner
- 📶 3GPP is cooperating with the public safety community
 - Technical participation in Release 12 is needed
- 📶 Where to balance benefits of reuse Vs customization?
 - New business opportunities with commercial mobile operators
- 📶 Interworking and migration need careful consideration
- 📶 LTE based public safety networks
 - Use common off the shelf technology
 - Improve on existing capabilities with broadband and multimedia



For more information:

www.3gpp.org/Public-Safety

netovate.com/white-papers/

Netovate training course December 2013



Iain Sharp

Director, Netovate



- Consultancy
- Training
- Intellectual property