# LTE Standards for Public Safety – an independent analysis

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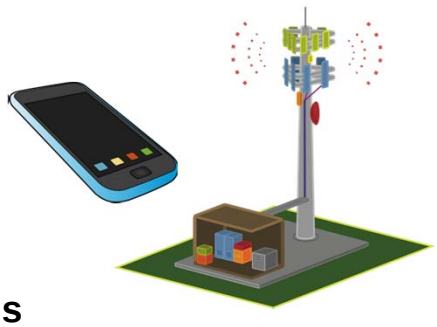
## LTE standards

Powerful

Constantly improving

Efficient



Reliable

Cheap

Secure

Ubiquitous

Choice of vendors/operators

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# 3GPP Release 12

**System Features**
Proximity services (ProSE)
Group call on LTE enablers (GCSE)

**Radio Layer Features**
Frequency band support
Power level support
Radio enablers for system features

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# The balance was struck

Less customization

More customization

More COTS technology reuse

Lower costs

Faster standardization

Less delivery risk

More operating modes supported

Performance (KPI) improvements

Better support for "difficult" radio situations

Few changes to system fundamentals –
Lots of value in overlay elements

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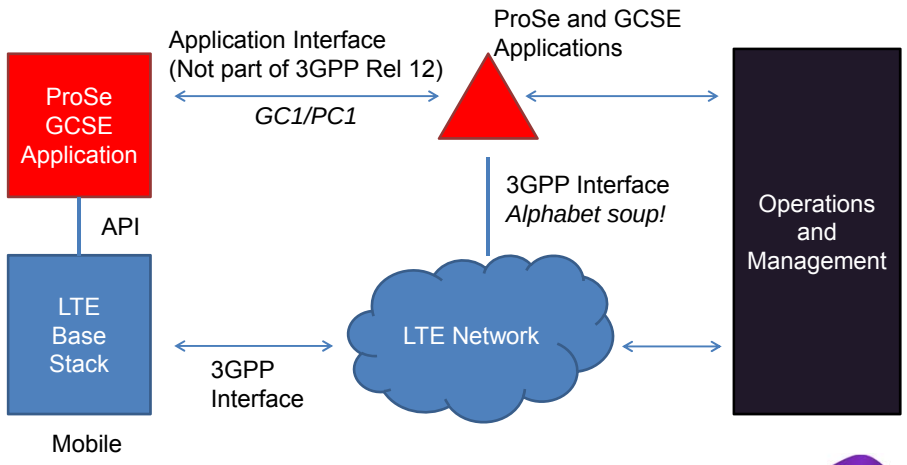
## Proximity services – Rel 12

- Client ↔ server application layer interface (PC1)
  "not specified in this release"
- No User Equipment (UE) to network relay
- No out of coverage discovery
- Direct Mode limited in scope:
  - One-to-many only
  - Connectionless
  - No QoS

## Group Calling (GCSE)

- Client ↔ server application layer interface (GC1)
  "not specified in this release"
- Delivery with unicast or broadcast service
  - Not with UE to network relay
- GCSE app manages which service to use
  - Dynamically!
  - Manages continuity between modes
  - Manages group call sessions and floor control (non-standard for now)

# Essentials of the architecture

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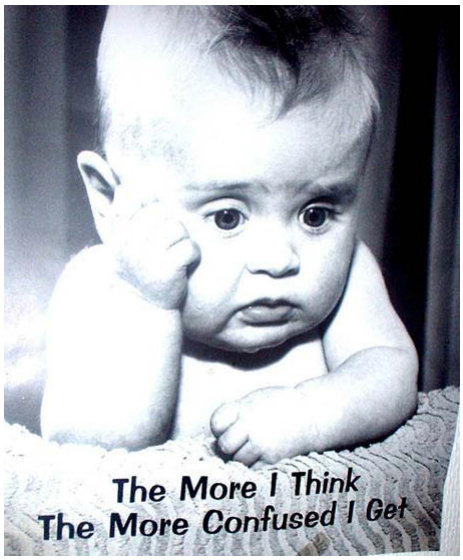


PS applications are not easy!

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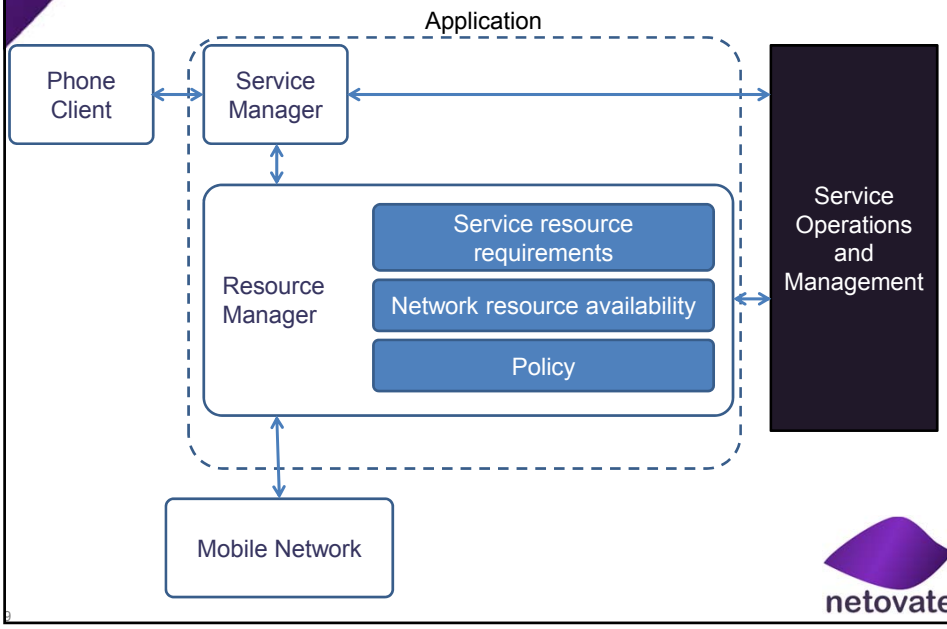
# Inside the applications

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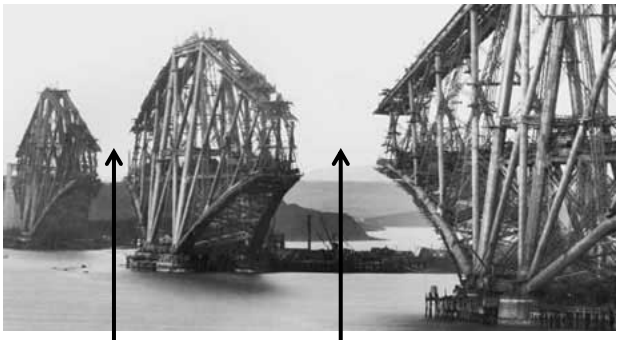
# LTE standards – gaps to fill



Charging

Provisioning

3GPP provides base interfaces, systems are highly operator-specific

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## Hosting PS users on cellular

- Standard protects cellular services from unintentional public safety disruption
  - User access to PS features is subscription checked
- We don't know the charging model for PS usage of host networks
- What is integration process between PS applications and host networks?
- How is (dynamic) resource information shared?

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## Some performance aspects

- Need pre-established MBMS bearers
  - Multicast connection may take 10-20s without
- Joining group may be slower than ideal
  - Up to ~500ms vs 300ms target
- Unicast bearer quality
  - Guarantee and be inefficient or optimize while increasing latency?
- Handover between unicast and multicast modes – lots of questions in practice

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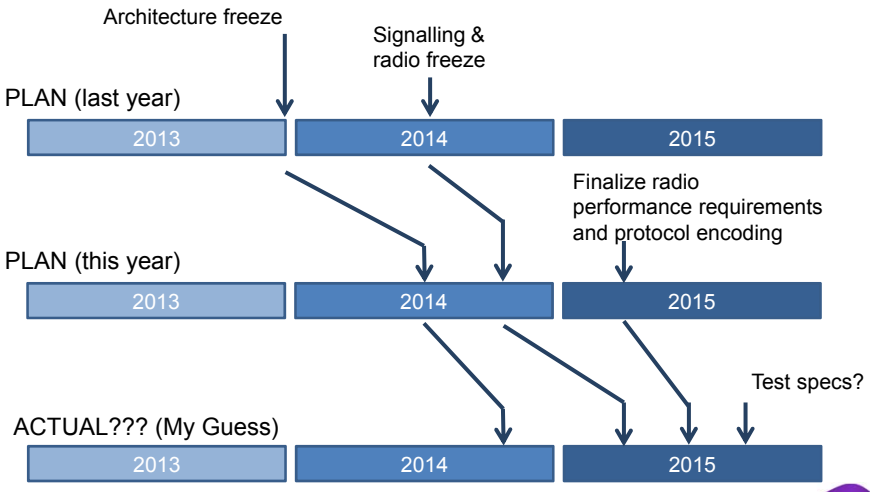
# 3GPP Release 12 Timing

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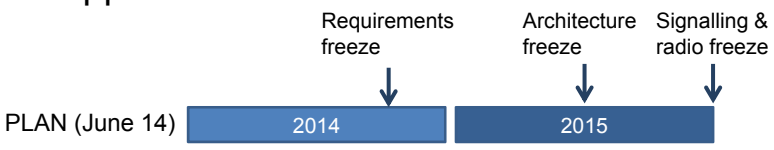
# Release 13

- Group Call
  completion of original Rel. 12 requirements
- ProSe
  completion of original Rel. 12 requirements ++
- Isolated EUTRAN
  support for backhaul failure
- Mission Critical Push to Talk Over LTE application




Maybe add 6 months to finalization date for reality

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## Risks

- Standards availability is a dependency you can't control
- Release 12 won't gain traction in market
  - Many will choose to wait for Release 13
- Complex relationship between PS applications and host network

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## Risk mitigation

- Wait (if you can)

  …sorry, but it's true…
- Prepare operating modes ahead of standards:
  - Billing
  - Provisioning
  - KPIs
  - Integration processes
  - Resource management/policy
- Prepare for migration off pre-standard services

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always

First deployments are incredibly painful

BUT you can choose where to take the pain:

in the planning phase, or

in the mopping-up phase

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Iain Sharp

Director, Netovate

- Consultancy
- Training
- Intellectual property

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