

LTE25™ Network Solutions

Push-to-talk P25 over LTE



Seamless, push-to-talk
P25 over LTE communication.

Bridge LTE networks and existing APCO P25 narrowband networks with Etherstack's integrated LTE25 solution.

Features

- Mission critical high availability solution
- Listen to multiple talkgroups simultaneously
- PTT group calls within the LTE network
- Talk directly to the dispatch center
- Priority and emergency calls supported
- End-to-end encryption between LTE & P25
- Location services allows LTE & P25 units to be tracked
- Uses native P25 vocoder
- Runs on COTS LTE Android platforms
- Reduced cost of ownership
- Geographically diverse Disaster Recovery Node
- Fast call setup times between P25 & LTE devices

The world is changing. New technologies and challenges present themselves daily to our front line responders. These challenges need solutions, and Etherstack is delivering by providing future proof migration paths for the radio networks that lives depend upon.

Emerging technologies like LTE need to be harnessed into solutions that deliver benefits to the end user as soon as possible, yet take into consideration the large existing installed narrowband radio asset base.

At the same time, Etherstack understands that LTE will not replace narrowband services such as direct mode operation in the near term, nor will coverage exist everywhere our users go.

So how best to bridge the technology gap? How to choose the path for future infrastructure deployment? Talk to Etherstack. We can help plan a sensible and affordable transition from one technology to another - a

seamless migration path allowing complete interoperability between different communities of narrowband and broadband LTE users in a harmonized network.

Etherstack's LTE25 Softswitch solution and LTE25 Android Client provide robust and secure public safety voice and data services within the LTE network, while still being able to bridge new APCO P25 digital radio networks as well as legacy LMR/PMR assets.

Etherstack's LTE25 solution provides the perfect blend for the migration to LTE.

LTE25 Network Elements

The Etherstack LTE25 solution consists of a number of network elements that are hosted (preferably) within the LTE Evolved Packet Core (EPC). The heart of the solution is the Etherstack high availability LTE25 Softswitch, which is responsible for the management of calls and services within the overall PTT-over-Cellular solution within the LTE network and clients, as well as managing interfaces to third party LMR network solutions such as APCO P25, TETRA and MPT1327 networks.

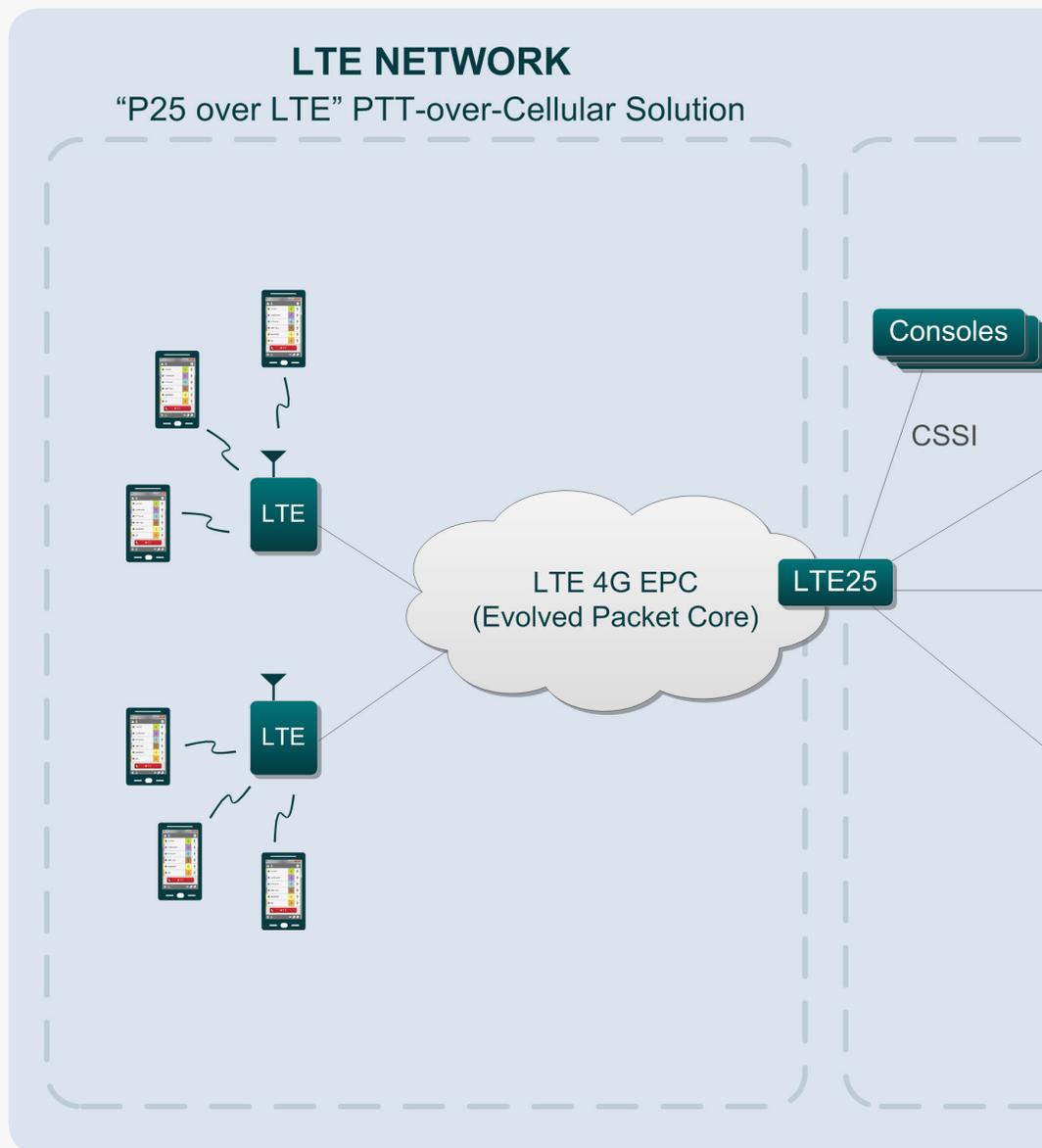
Besides the LTE25 Softswitch, five other optional IP based network elements are offered in the solution, including the DSN (Data Service Node SGSN/GGSN), the LSC (Location Services Center), the PSTNG (PSTN Gateway), the KMF (Key Management Facility) and LOC (Local Operations Console).

Each of these network elements is available in a high availability solution consisting of an active and standby server.

Due to Etherstack's architecture, these network elements can host multiple end customer organizations (e.g. NYPD, FDNY) in a "multi-agency" solution. Alternatively, dedicated solution sets can be deployed within the EPC for specific end customers. For example, the New York Police Department or Fire Department may have their own dedicated LTE25 softswitch.

LTE25 Softswitch – a high availability all-IP SIP & RTP based softswitch designed specifically for mission critical radio networks. The softswitch supports a rich supplementary service feature set based on public safety LMR network call types including group calls, fast call setup times, emergency calls and encrypted voice services. The solution supports geographical redundancy (Disaster Recovery Node) and multiple LTE25 softswitches can be deployed within the EPC to provide regionalization of voice traffic services (reducing backhaul considerations) or greater segregation of traffic services (e.g. police vs industry).

The LTE25 Softswitch supports the TIA TR.8 ISSI (inter-sub system interface), allowing it to bridge other vendors' APCO P25 & LMR networks, as well as

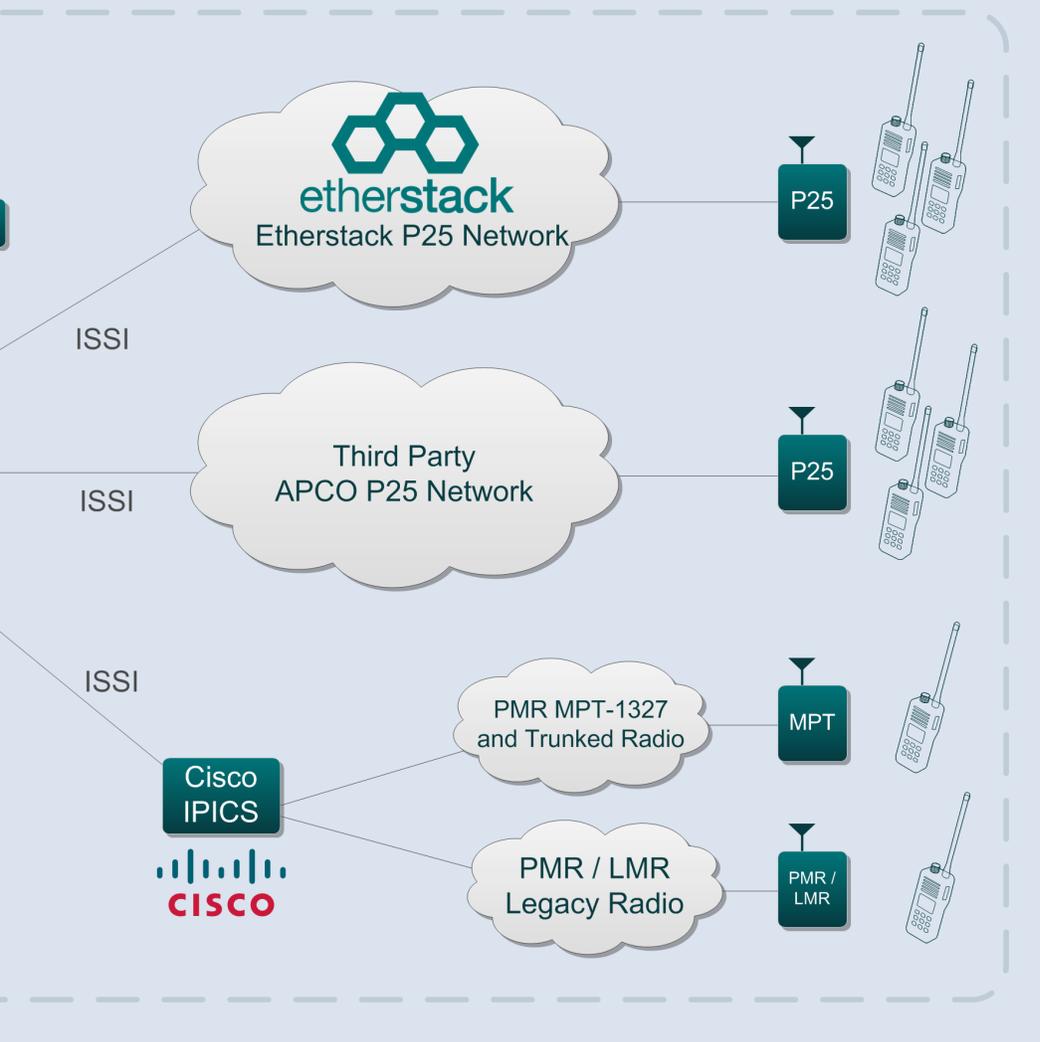


the TIA TR.8 CSSI (console sub system interface) for connectivity to third party console applications and digital voice recorders. The LTE25 Softswitch can also manage Etherstack P25 radio network sites directly, and incorporates a common Network Location Register (NLR) for unified subscriber management. LTE clients and P25 users can be members of the same group seamlessly. The LTE25 can bridge via the ISSI to the Cisco IPICS gateway, which can interface directly to MPT1327 fleets. The Cisco IPICS can map MPT1327 units and fleets to APCO P25 unit and group IDs, allowing unified calling between LTE, P25 and MPT1327 units.

DSN – a high availability all-IP data service node (SGSN/GGSN) that manages SMDCP data connections for secure applications on the LTE25 Android Client handsets, such as encrypted location.

KMF – a high availability network element that manages cryptographic key distribution within the LTE25 and APCO P25 network solution. The KMF manages Over-The-Air-Rekeying (OTAR) sessions between LTE25 Client handsets and the key manager in the network. Etherstack's KMF can be used to rekey either LTE25 client handsets or traditional P25 client handsets from the same manager simultaneously. In this way, blended fleets

PMR NETWORK



of LTE terminal devices and P25 terminal devices can be rekeyed in the same way at the same time. One or more KMFs (private or shared) can be deployed in the EPC.

PSTNG – Etherstack’s PSTN & PABX Gateway product supporting multiple PSTN interface options, including 2W DTMF, ISDN and IP based telephony interfaces. Multiple PSTNGs can be deployed within the EPC core. For example, the New York Police Department could have a dedicated PSTNG interfacing to their Cisco back office IP phone system providing short form dialing from back office desk phones directly to LTE25

clients and APCO P25 handsets in the LTE or attached P25 handsets. End-to-end encryption can be supported between the PSTNG and Android clients, with audio being presented in the clear to the PSTN/PABX interface. By negotiation with Etherstack and Cisco, an end-to-end encrypted solution to a Cisco IP phone is possible.

LOC – Etherstack’s state of the art Local Operations Console (LOC) provides team management functions within the client’s enterprise network. Distinct from a larger Network Operations Centre (NOC) based console from manufacturers such as Zetron and Intergraph, the LOC provides a desktop based solution blending AVL/ GPS fleet management and dispatch calling functions. Utilizing Google Earth mapping, the LOC communicates with the LSC to provide mapped location details of team members within the network. The LOC can see both LTE users and P25 users simultaneously and establish calls to individuals or groups of users at the click of a mouse.

The LOC can be deployed within the enterprise network. For example, the NYPD station would be able to see the location of its vehicles on an office PC and choose the closest vehicle to respond to an incident called in by the public. The LOC also allows third party application integration – for example, an energy company can present faults from its electricity network management system to regional LOC operators, allowing the regional LOC operator to dispatch the incident to the most appropriate team member based on location, skills and availability.

Physical

Physically, all network elements are deployed on COTS industrial grade Linux platforms for deployment into 19” racks. Each LTE25 softswitch and other network element (including High Availability standby server) occupies 2 RU or 4 RU of space, depending on model ordered.

Each LTE25 softswitch presents a 100/1000Mbps ethernet interface to the LTE EPC.

The LOC (local operations console) can be deployed on a laptop or desktop device typically connected back to the EPC via a VPN connection over a broadband interface (such as DSL). An optional headset and PTT-footswitch can be supplied for each LOC.

LTE25 Android Client

Highlights

- Listen to multiple talkgroups simultaneously
- PTT group calls within the LTE network
- Talk directly to the dispatch center
- Priority and Emergency Calls supported
- End to end encryption between LTE & P25
- Location Services allows LTE & P25 units to be tracked
- Over-The-Air-Rekeying (OTAR)
- Multiple profiles and user logins
- Uses native P25 vocoder
- Runs on COTS LTE Android platforms
- Reduced cost of ownership
- Encrypted calls to enterprise PABX



LTE25 Android Client Device

Etherstack's LTE25 Android Client application runs on COTS Android LTE platforms. The application is based on Etherstack's APCO P25 mobile station protocol stack solution that is licensed by many P25 equipment manufacturers globally.

Uniquely, Etherstack's solution also includes the native P25 vocoder on the Android client which provides the following three core benefits in this true "P25 over LTE" solution:

- a) native vocoder avoids transcoding in the network, improving quality
- b) eliminates transcoding latency delay, and
- c) allows end-to-end encryption between traditional P25 handsets and the LTE device

Additionally, by using P25 application and supplementary services within the LTE client application, unified P25 and LTE groups call types are possible as well as common subscriber management functions (stun/unstun, ambient listening, OTAR) and unified location services ("blue force" tracking).

Etherstack's secure application solution decouples the choice of LTE handset, allowing the end user to choose a COTS LTE handset or a specialised LTE handset as meets their needs.

Etherstack LTE25 Android Clients can operate independently within the LTE network without connection to an existing P25 or legacy LMR network. Public safety group call capabilities and associated services are all available within the LTE network.

The LTE25 Android Clients communicate with each other via the LTE25 softswitch located within the LTE network. This softswitch provides open standard interfaces to emergency dispatch consoles conforming to the TIA TR.8 CSSI standard, and can interface to P25 digital trunked radio networks and legacy radio networks via the TIA TR.8 ISSI standard and Etherstack provided bridges and gateways.

When the LTE network is connected to an APCO P25 digital radio network, users can have either an LTE25 handset or a traditional APCO P25 radio and interoperate with each other.

The LTE25 softswitch can also communicate with the PSTN network and enterprise based PABXs, allowing secure calls between the LTE25 Android Client and the enterprise network.

About Etherstack

Etherstack engineers specialise in radio communications software.

With two decades experience and an international client base, Etherstack combines wireless protocol software design with all-IP soft switching expertise derived across professional mobile radio, military and cellular communications.

We work closely with our customers to achieve technical excellence, successful delivery at fixed price, ongoing support and software that can be reused.



Sydney (GMT+10)
+61 2 8399 7500
info.au@etherstack.com

Yokohama (GMT+9)
+81 45 342 9050
info.jp@etherstack.com

Singapore (GMT+8)
+65 8189 6200
info.sg@etherstack.com

London (GMT)
+44 207 734 0200
info.eu@etherstack.com

New York (GMT-5)
+1 917 661 4110
info.na@etherstack.com