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

Bridge LTE networks and existing PMR narrowband radio networks with Etherstack’s integrated PMR-LTE solution.

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 harmonised network.

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

Etherstack’s PMR-LTE solution provides the perfect blend for the migration to LTE.

Features

- Mission critical high availability solution
- Listen to multiple talkgroups simultaneously
- PTT group calls within the LTE network
- Talk directly to the dispatch centre
- Priority and emergency calls supported
- End-to-end encryption between LTE & PMR terminals
- Location services allows LTE & PMR units to be tracked
- Uses native TETRA/P25/DMR vocoder
- Runs on COTS LTE Android platforms
- Reduced cost of ownership
- Geographically diverse Disaster Recovery Node
- Fast call setup times between PMR & LTE devices
The Etherstack PMR-LTE 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 PMR-LTE 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 network solutions such as P25, TETRA, DMR and MPT1327 networks.

Besides the PMR-LTE 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 Centre), 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 organisations (e.g. City of London Police, London Fire Brigade) in a “multi-agency” solution. Alternatively, dedicated solution sets can be deployed within the EPC for specific end customers. For example, a police department or fire department may have their own dedicated PMR-LTE softswitch.

**PMR-LTE 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 PMR 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 PMR-LTE softswitches can be deployed within the EPC to provide regionalisation of voice traffic services (reducing backhaul considerations) or greater segregation of traffic services.

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

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

**KMF** – a high availability network element that manages cryptographic key distribution within the PMR-LTE and PMR network solution. The KMF manages Over-The-Air-Rekeying (OTAR) sessions between PMR-LTE Client handsets and the key manager in the network. Etherstack’s KMF can be used to rekey either PMR-LTE client handsets or traditional PMR client handsets from the same
manager simultaneously. In this way, blended fleets of LTE terminal devices and PMR 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, a 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 PMR-LTE clients and PMR handsets in the LTE or attached PMR 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), the LOC provides a desktop based solution blending AVL/GPS fleet management and dispatch calling functions. Utilising 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 PMR 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 police 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 PMR-LTE softswitch and other network element (including High Availability standby server) occupies 2 RU or 4 RU of space, depending on model ordered.

Each PMR-LTE 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.
Etherstack's PMR-LTE Android Client application runs on COTS Android LTE platforms. The application is based on Etherstack mobile station protocol stack technology that is licensed by many PMR equipment manufacturers globally.

Uniquely, Etherstack's solution also includes the native TETRA/P25/DMR vocoder on the Android client which provides the following three core benefits in this true “PMR 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 PMR handsets and the LTE device

Additionally, by using PMR application and supplementary services within the LTE client application, unified PMR 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 PMR-LTE Android Clients can operate independently within the LTE network without connection to a PMR network. Public safety group call capabilities and associated services are all available within the LTE network.

The PMR-LTE Android Clients communicate with each other via the PMR-LTE 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 PMR digital trunked radio networks and legacy radio networks via the TIA TR.8 ISSI standard or Etherstack provided bridges and gateways.

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

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

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.

Want to learn more about PMR-LTE?
Email us at info.eu@etherstack.com.