auria *wireless*

LTE25 Network Solutions
PTT P25 over LTE

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

Bridge LTE networks and existing APCO P25 narrowband networks with Auria'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 centre
- 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 are presenting themselves every day to our front line responders. These challenges need solutions and Auria 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, Auria understands that LTE will not replace narrowband services such as direct mode operation in the near term, nor will coverage exist to all the places that our user community needs to go to.

So how best to bridge the technology gap? How to choose the path for future infrastructure deployment? Talk to Auria. 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.

Auria's LTE25 Softswitch solution for LTE networks and LTE25 Android client provide robust and secure public safety voice and data services within the LTE network, while allowing bridging to new APCO P25 digital radio networks as well as legacy LMR/PMR assets.

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

LTE25 Network Elements

The Auria Wireless 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 Auria 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 PMR network solutions such as APCO P25 networks, TETRA networks 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 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 Auria's architecture, these network elements can host multiple end customer organisations (e.g. NSW Fire, NSW Police, St John's Ambulance, Roads & Transport Agency) in a "multi-agency" solution. Alternatively, dedicated solution sets can be deployed within the EPC for specific end customers. For example, the NSW Police or Attorney-Generals 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 supporting 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 LTE25 softswitches can be deployed within the EPC to provide regionalisation of voice traffic services (reducing backhaul considerations) or to provide 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 be bridged to other vendors' APCO P25 & PMR networks, as well at 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 Auria P25 radio network sites directly, and incorporates a common Network Location Register (NLR) for unified subscriber manage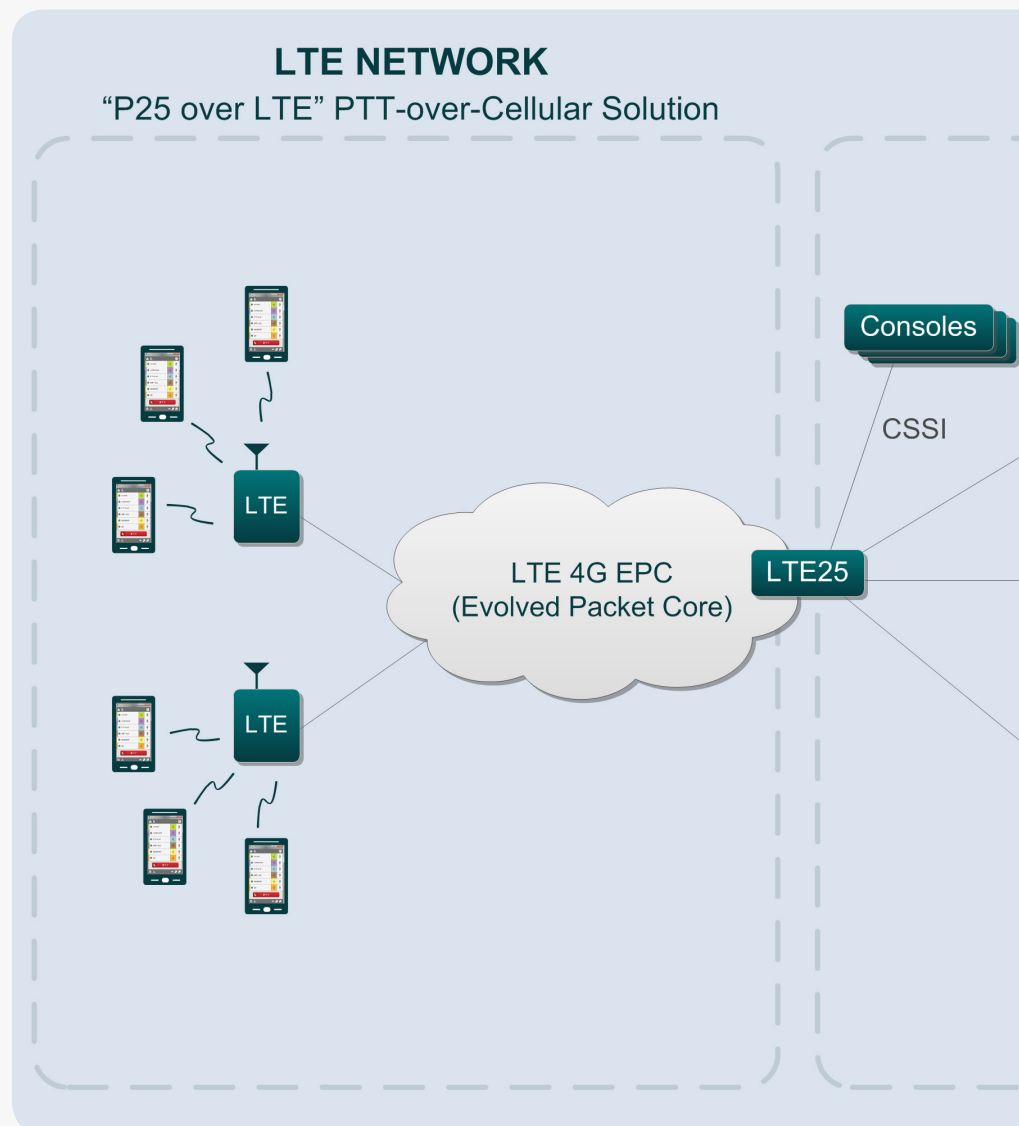ment. LTE clients and P25 users can be members of the same group seamlessly. The LTE25 can bridge via the ISSI to the Cisco IPICS gateway, which can interface directly to Fleetcoms MPT1327 fleets. The Cisco IPICS can map MPT1327 units and fleets to APCO P25 unit and group IDs, allowing unified calling between LTE, P25 and MPT1327 units.

DSN – a high availability all-IP data service node (SGSN/GGSN) that manages SNDCP 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. Auria's KMF can be used to rekey either LTE25 client handsets or traditional P25 client handsets (such as the Motorola XTS5000) from the same manager simultaneously. In this way, blended fleets 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 – Auria'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 NSW Police 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.

LTE NETWORK
"P25 over LTE" PTT-over-Cellular Solution

LTE 4G EPC (Evolved Packet Core) · LTE · LTE25 · Consoles · CSSI

LOC – Auria's state of the art Local Operations Console (LOC) provides team management functions within the Fleetcoms 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. 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 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 Bondi Beach Police Station would be able to see the location of its six vehicles on an office PC and choose the closest vehicle to respond to an incident called in by the public. The LOC also allows 3rd party application integration – for example, Ergon Energy in Queensland will present faults from its electricity network management system to regional LOC operators (e.g. Toowoomba), 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.
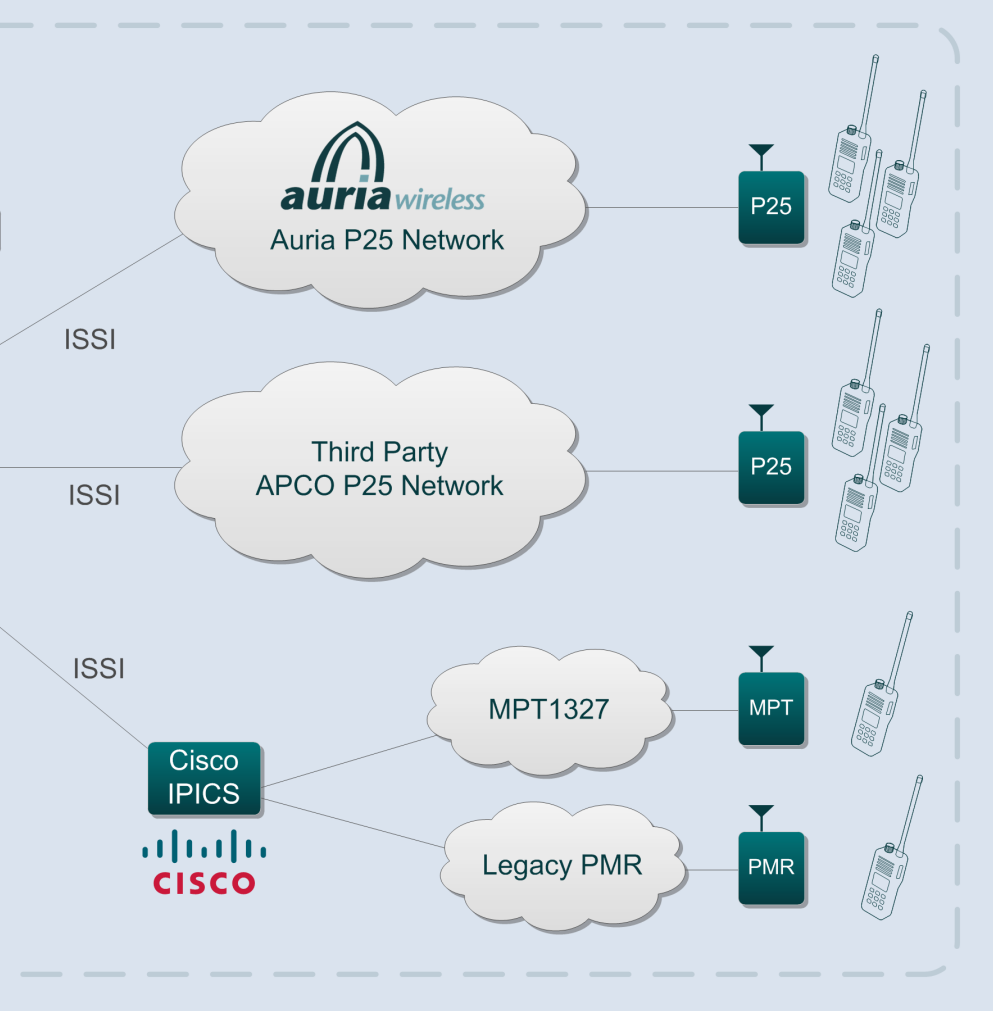
LTE25 Softswitch Features
- Mission Critical high availability solution
- Bridges P25 & LTE networks
- Replicates all P25 services inside LTE environment
- Uses native P25 application on LTE Android Client
- Supports end-to-end encryption between LTE & P25
- No transcoding in the network, improving quality
- Fast call setup times between P25 & LTE devices
- Geographically diverse Disaster Recovery Node

LTE25 Softswitch Services
- Seamless AVL/GPS solution between P25 & LTE
- Integrated "Blue Force Tracking" application
- Encrypted P25 data and GPS information in LTE
- P25 group calls and emergency/priority in LTE
- Multi profile capability
- Integrated subscriber management for P25 & LTE
- Secure LTE25 text messaging
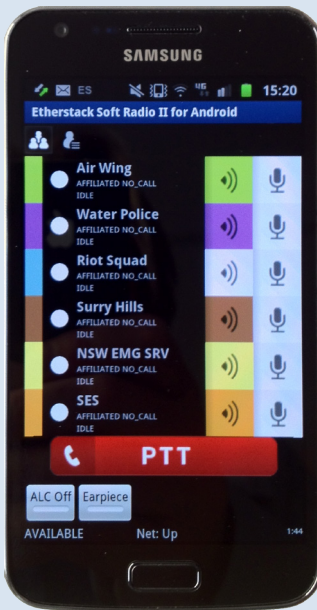- Unified KMF for OTAR of P25 & LTE users

PMR NETWORK

auria wireless
Auria P25 Network
P25

ISSI

Third Party APCO P25 Network
P25

ISSI

ISSI

Cisco IPICS

CISCO

MPT1327
MPT

Legacy PMR
PMR

LTE25 Android Client

LTE25 Android Client Device

Auria'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, Auria'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, avoiding transcoding quality loss
b) eliminates transcoding latency delay, and
c) allows end-to-end encryption between traditional P25 handsets (such as Motorola's XTS5000 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).

Auria'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.

Auria LTE25 Android Clients can operate independently within the LTE network without connection to an existing P25 or legacy PMR 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 Auria 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 be able to 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.