

PERSEUS CSP  
COMMUNICATION  
SERVICES PLATFORM



# PERSEUS - CSP: THE EVOLUTION OF PMR NETWORKS

PERSEUS is a family of products and sub-systems both at Core Network and Terminal level that can be used as enabling products for building PMR networks of the next generation. The continuous evolution of communication networks, the availability of new access and transport technologies and the possibility of transmitting increasing amounts of data in shorter times allow the definition of new applications and services dedicated to the end user.

A communications network should ensure user connectivity, transparently providing the most suitable means of transmission with the Quality of Service (QoS) requested for each application. Taking into account all these issues, PERSEUS (Professional and Emergency Resilient System Enabling Ubiquitous Services) represents a complete communication system. It is both modular and scalable to meet varying application requirements.

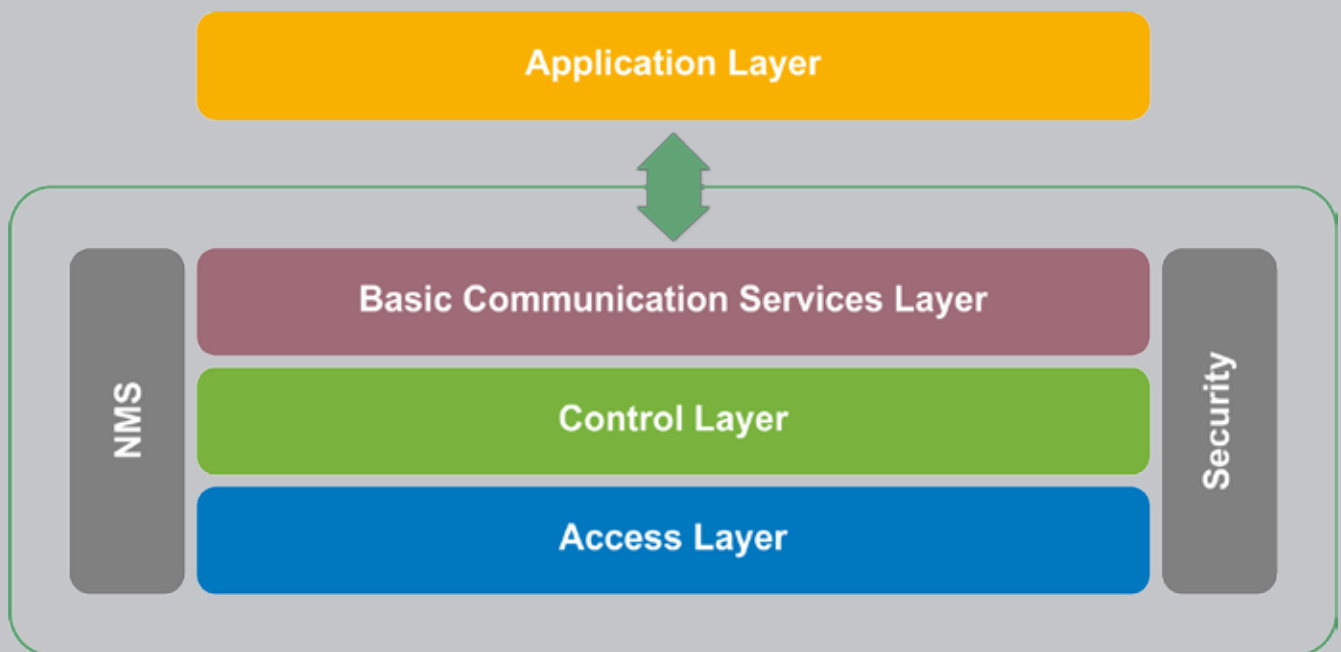
PERSEUS offers a reliable solution to the requirements (in terms of functional and non-functional requirements) of a PMR network. At the same time, it is able to manage different radio access technologies as a single network.

The company's experience in communication networks for public safety, defence and transport supported the definition of an interoperable solution based on communication standards but providing bespoke features making PERSEUS unique.

## MAIN FEATURES

- Interoperability: integration of different access technologies for voice and data communications, to ensure a common set of shared services
- Service-oriented system
- Standards interface towards the Application layer
- Network adaptability for automatic selection of the most suitable communication technology, depending on network availability, user profile and the requested services
- Fixed and wireless broadband connections
- Secure communications and network access
- Network re-configurability and system resistance to problems caused by link unavailability
- Fast-deployable infrastructure in no-coverage areas or when traffic levels increase
- Resilience in all conditions.





## ARCHITECTURE

### Managing Heterogeneous Systems

CSP architecture has the ability to characterise communication requests coming from a User or from the Application Layer towards a User belonging to a specific Access Network. At the same time, it can generalize the request (from the Application Layer) to a communication service (exposed to the Application level by the Basic Communication Service Layer) such that an application can ignore which Access Network is involved by the communication service invoked. On this basis it is possible to deliver INTEROPERABILITY in a heterogeneous communication environment.

### Access Layer

Is the level corresponding to the different communication technologies present in the Heterogeneous Network to be managed and for which a Communication Solution is to be provided. Strictly speaking, it is not part of the CSP framework, but it affects modules present in the Control Layers.

### Control Layer

Is a complete Core Network acting as a common control plane for all the different communication technologies to be managed. It comprises modules that, conceptually, are derived from an IP Multimedia System model but are implemented in a suitable way for serving PMR and Military (non-tactical) networks. Through this common control plane, the communication services can be made available to the underlying Access Networks in a unified way.

### Basic Communication Services Layer

Represents the services that can be used by applications. These services hide the underlying complexity due to the Heterogeneous Network. A service can be shared by all those communication technologies having the necessary capabilities (e. g. voice and messages are shared by all technologies; but images and video are not shareable among all of them).

So, an application can serve distributed users within different communication systems but belonging to a unique network.

This architecture encompasses an independent user database for those users that are enabled to communicate with other access technologies beyond their own.

Exploiting the database attributes and presence services, it is possible also to individualise a user and call him/her even when it is not known to the caller which access technology he/she is using at the time of calling.

## A SERVICE-ORIENTED SYSTEM

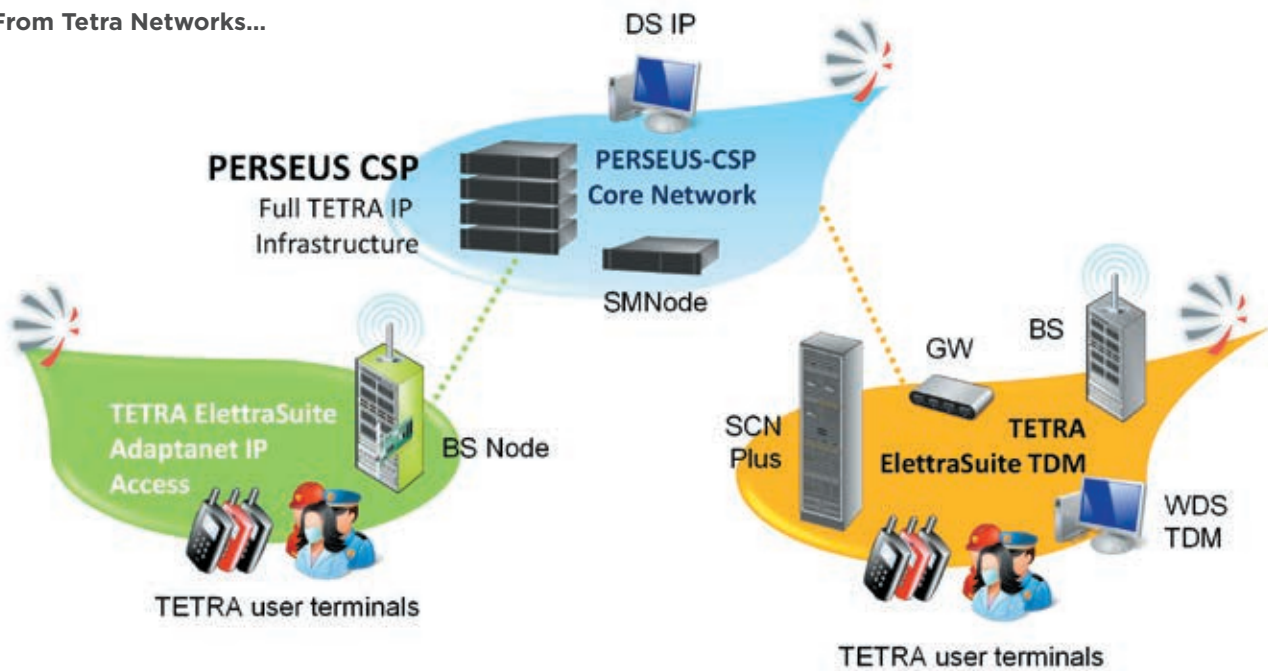
Communication services are “detached” from the physical layer characterizing the access used by a particular user. A user could even have different devices to be used under different technologies.

The CSP allows customers to achieve:

- Interoperability among different PMR technologies
- Easier use of the communication services by the application developers
- Integration of non-PMR technologies whose services can be imported and re-used in the new framework.

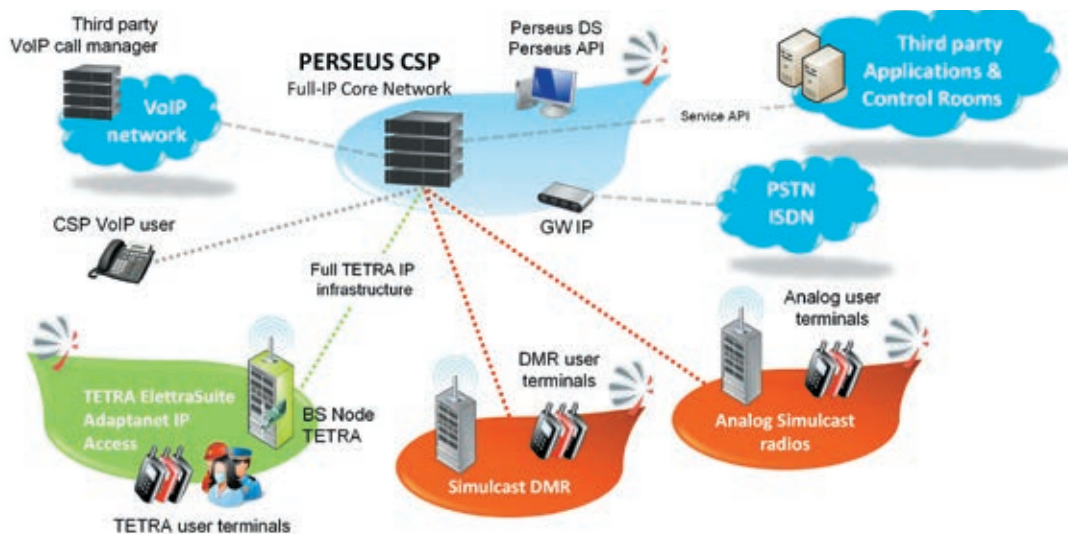
## PMR HETEROGONOUS SCENARIOS

From Tetra Networks...



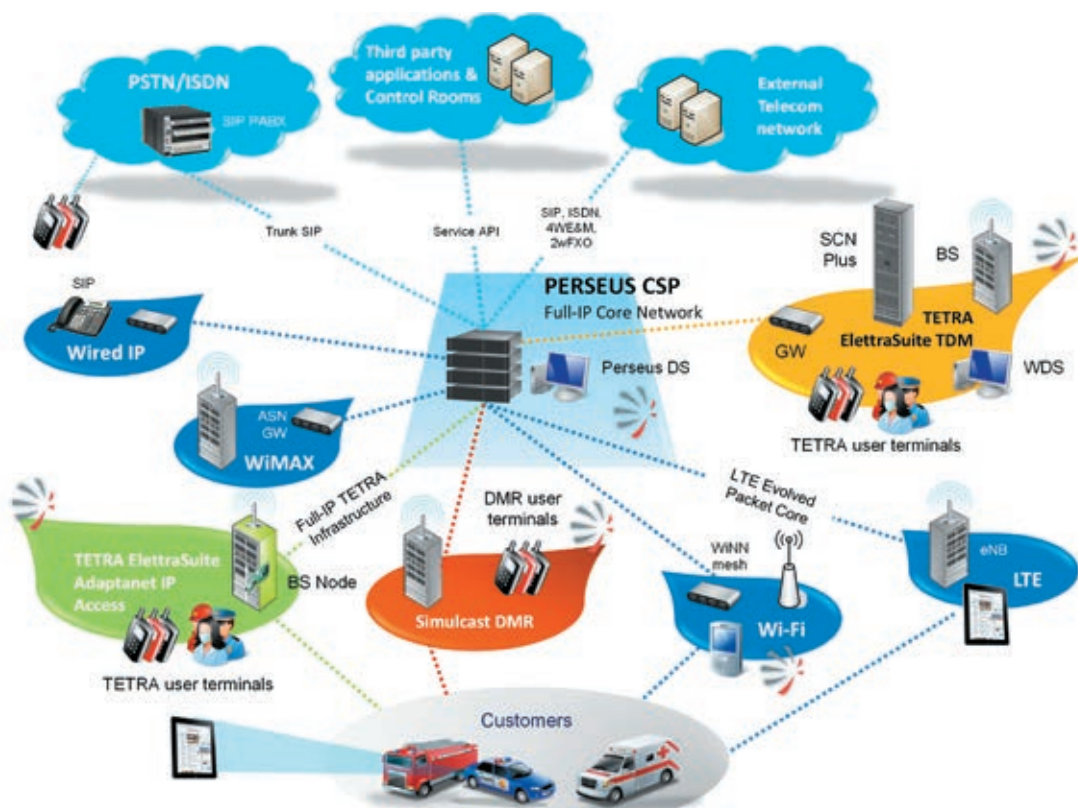
Old TETRA assets, based on TDM, are re-usable into a new system using TETRA ElettraSuite Adaptanet IP. The overall network can grow according to the funds available to of the customer. He/she is not forced to devote great investment to a completely new system based on IP transport - nor to renounce a previous system.

### ...To Mixed PMr Networks



Now it possible for mixed PMr technologies to be joined in a unique system adapting coverage by means of the technology most suited according to the requirements and/or economic considerations.

### ... And Adding Broadband Technologies

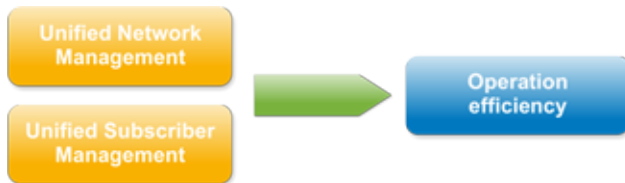


This architecture allows the inclusion of any access technology (provided that the proper entity(ies) inside the control layer is (are) modified/designed). So, there is no barrier to the introduction of broadband technologies. A great benefit is that those customers having greater needs can introduce - NOW - a standard (commercial) broadband technology if their requirements allow this choice, maintaining all the other CSP characteristics: primarily, interoperability.

## Advantages of architecture



The architecture is scalable, from a base level transportable system suitable for fast-deployment usage to those of a regional/national network. There are three versions (Compact, Light, Full) covering the entire range from small to very large systems. An important characteristic of the architecture is its capability to be distributed. This enables the ability to follow future network evolution on the infrastructure side.



From the operational viewpoint, the heterogeneous network can be regarded as a unique network, even if each access technology maintains its individuality (included dedicated management tools), from the NMS point of view a general view of the overall network status is given in order to have a picture at the highest level. Subscribers are also profiled independently on the specific communication technology used. They will have a profile at CSP level able to establish their ability to communicate with other users of different talking-groups and organizations (and technological domains) and through different access technologies.



Co-ordination is also positively impacted by this architecture. In fact, it enables dispatchers to manage personnel on the field regardless of their organization and the access technology used. An in-field dispatching station can coordinate multi-agency operations locally and jointly with central control room(s).

One of the most important characteristic of the CSP architecture is the interoperability feature. This is possible because the services offered are all shareable among the access technologies connected to the platform. Clearly, not all technologies can sustain every service. However, a minimal subset of services (e.g., voice and text messages) are shareable among all users and this is a great improvement in multi-agency/multi-technology operation effectiveness and efficiency.



## Advantages of service orientation

You can focus on your PMR activities and targets because the communication services supplied are provided as PMR services, so they are already adapted for your role. Further, should you need to add new services, they can be added at the service layer and they are immediately extended to the access technologies belonging to the system.



Services are independent on the underlying access technologies so that they can be better linked to the applications and, in turn, to the business objectives. The result is the possibility to lower the cost to customize applications/services for a specific business.



The use of standard API enables application developers to write applications using well known interfaces. In addition, having services not dependent on a specific access technology avoids the need to know that technology. Re-use of communication services/applications already existing in third-party systems is possible. This helps to save money.

Last but not least, this architecture makes easier the choice among different business models for building applications. Internal as well as third-party development are almost equally selectable in that the training for third parties is minimized. The same is true for importing existing applications and for their eventual customization.

## NETWORK VISION

The LTE Broadband capability is scalable to reflect different needs and environments. The integrated network architecture offers a scalable data communication solution ranging from wideband TEDS to LTE that can be deployed (where requirement allow) on public infrastructures under the control of a private PMR core.

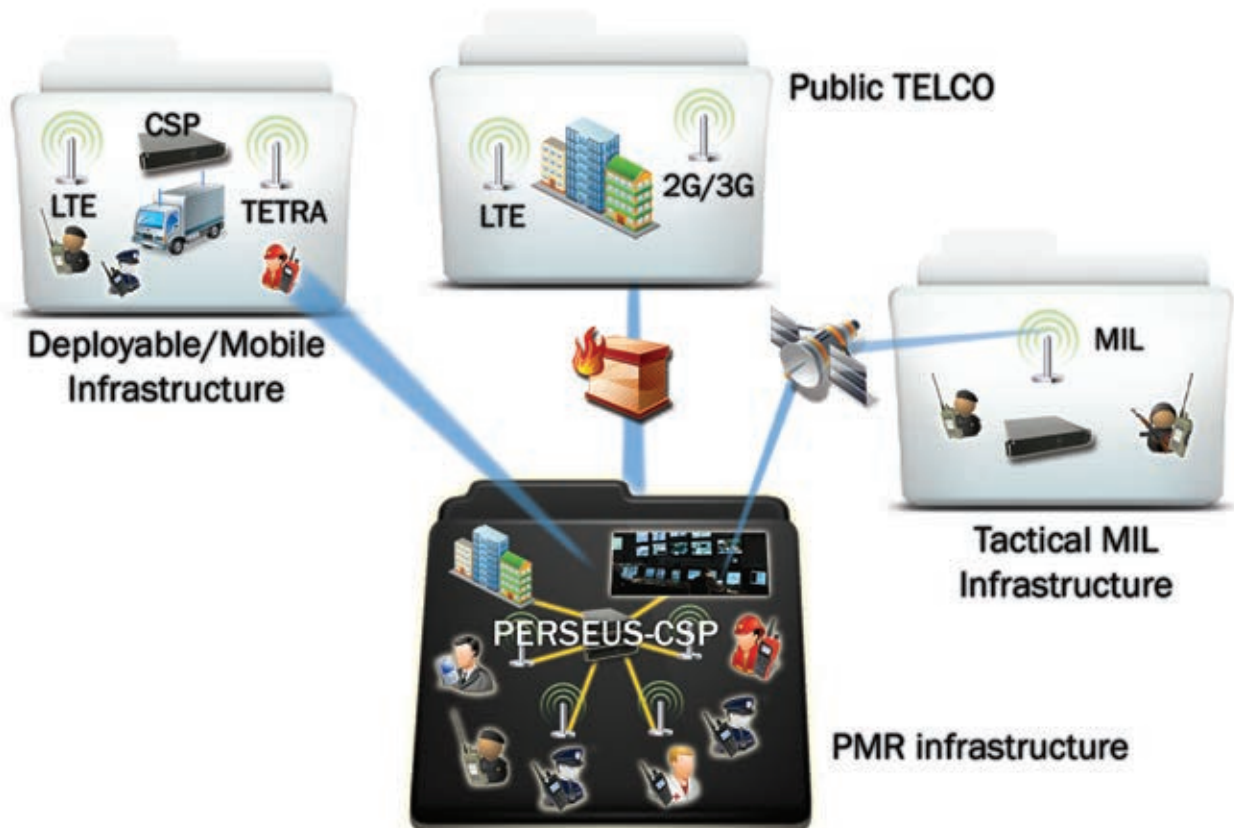
The Mission & Operational Critical solution is built upon scalability and flexibility paradigms. Using the PERSEUS CSP, it can support multiple technologies making it the optimal solutions to customers' needs. These range from single-site installations (suitable for deployable or mobile emergency systems) through to regional or national multiagency architectures.

### LTE advantages

The LTE solution is designed upon professional users' needs. Compact: suitable to small deployments without paying big entrance fees. Scalable: easily extendable to bigger configurations. PMR optimized: to guarantee QoS and response times typical of PMR applications.

### PERSEUS/CSP advantages

Scalability: configurations suitable for different networks from single vehicle to regional networks  
Unified network & subscriber management: for increased operational efficiency  
Unified Command & Control: easier multi-agency operations co-ordination and management  
Technology interworking: services transparently available across multitechnology domains.





leonardocompany.com

For more information please email [infomarketing@leonardocompany.com](mailto:infomarketing@leonardocompany.com)

Leonardo S.p.a.

Via delle Officine Galileo, 1 - 50013 Campi Bisenzio (FI) - Italy - Tel: +39 055 89501 - Fax: +39 055 8950600

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