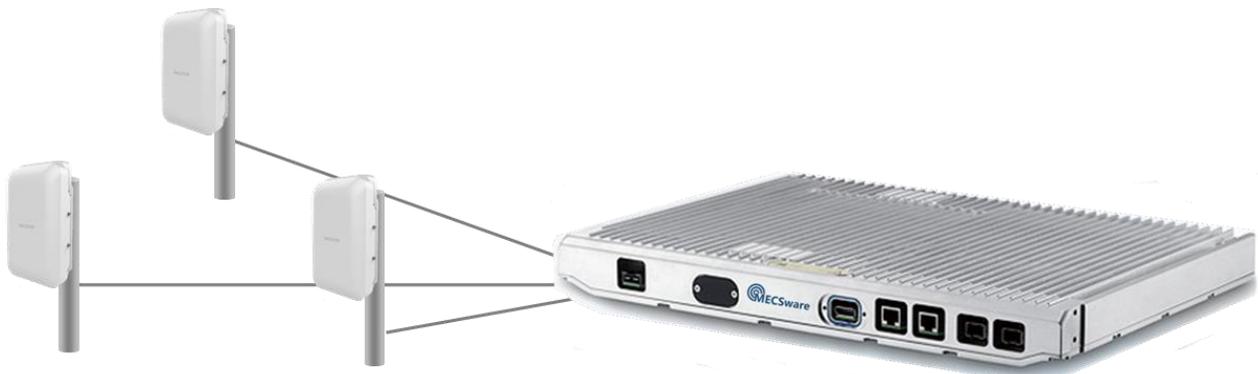


Private LTE Available NOW!



LTE Small Cell Base Station(s)

Mobile Edge Cloud Server (MECS)

The Challenge

Reliable and secure wireless connectivity is an essential requirement for all industries. Nowadays, all types of communications, Human-to-Human (H2H), Human-to-Machine (H2M) and Machine-to-Machine (M2M) are needed. Some of which require centralized cloud processing; however, a lot of data has a **local context**.

The network must be capable of supporting various **Quality-of-Service (QoS)** profiles. Long communication data delays (latencies) may degrade the performance or quality of some processes, or may even be prohibitive.

Strong security and privacy are major concerns for enterprises. For many enterprise applications, data exposure to the “cloud” cannot be tolerated.

Public mobile networks are frequently unable to fully meet the above-stated requirements. The obvious alternative would be to build the local network using Short Range Device (SRD) technologies such as WLAN. However, due to operation in unlicensed spectrum, i.e. shared frequency bands, these technologies were designed to cover only small areas. Therefore, building radio coverage for e.g. a large industrial campus may require a high number of Access Points, thus becoming expensive.

Our Solution

The solution, based on MECsWare’s **Mobile Edge Cloud Server (MECS)** and Sercomm’s outdoor-grade **Small Cell Base Stations**, follows four main ideas:

The solution is based on **LTE radio technology**. LTE was originally designed for **licensed spectrum**, i.e. exclusive frequency bands, thus taking advantage of **higher reliability** due to less interference from other devices and a **higher radio link budget** compared to SRD technologies. Large coverage areas can be supported more cost-efficiently. Spectrum access rules may vary between countries, new licensing schemes are emerging. In Germany, for example, 100 MHz of LTE spectrum (3700-3800 MHz) has been dedicated to regional private networks.

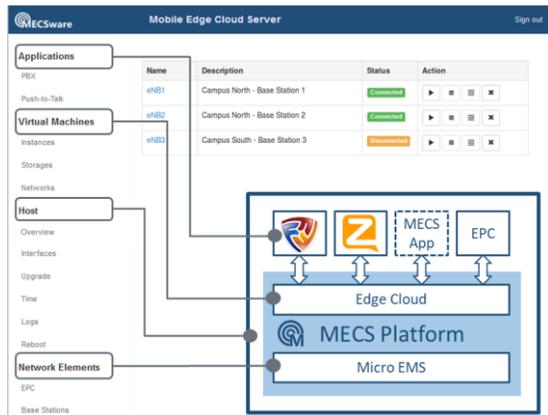
LTE uses a centralized Radio Resource Control (RRC), supporting **sophisticated QoS management**. Thus, in contrast to WLAN’s CSMA/CA-based access control, throughput and latencies can be well controlled. Other advanced LTE features such as seamless handover, robust security and scalability are preserved.

With the MECS, as a key differentiator to traditional mobile networks, the LTE Core Network functions (EPC) are relocated into the

Access Network. That means, the solution supports **local routing and application processing**, thus reducing backhaul traffic and avoiding end-to-end latency issues for local traffic caused by long data paths. Availability is improved since the network remains functional even in case the backhaul connection breaks.

Using a built-in **Micro EMS** (Element Management System), the complexity of the underlying elements is hidden and the whole network can be easily managed through a Web-based Graphical User Interface (GUI).

An integrated **Edge Cloud** infrastructure provides computing resources and storage capacity to user applications (MECS Apps) and connects them to the user devices on the shortest possible path through the private LTE network. Installation of additional Application Servers, which may be expensive in harsh outdoor environments, can be avoided.



In an industrial use case, a common infrastructure can be built cost efficiently for any kind of mobile communication. For example, real-time applications may be implemented as a MECS App. Large amounts of data may be pre-processed locally to save uplink connection costs. With the optional Push-to-Talk MECS App, traditional Walkie-Talkies can be replaced by ordinary or ruggedized smartphones.

Due to its compactness, the MECS is easily transportable. It works with ambient temperatures from -20°C to +55°C, i.e. datacenter environmental conditions are not required. The architecture will also support the adoption of future 3GPP evolutionary steps such as LTE-M, also known as LTE for Machine-Type Communications (LTE-MTC), Narrowband LTE-M (NB-LTE-M) or NB-IoT.



MECS	
Operating Env.	-20°C to +55°C with active cooling, IP65
CPU	24/32/40 logical cores
RAM	16/64/96 GB
Storage	Dual sATA SSD drive bays
Edge Cloud	KVM based
System VMs	EPC IMS (optional)
EPC functions	MME, S-GW, P-GW, HSS, PCRF
EPC interfaces	S1, SGI
MECS Apps	Push-to-Talk (optional) PBX (optional)
O&M	Web GUI, incl. all network elements
LTE Small Cell Base Station	
Operating env.	-20°C to +50°C, IP65
Mounting options	Pole/wall/strand
LTE band	3400–3800 MHz (B42/43) other bands on request
LTE Data Communication Equipment (DCE)	
Operating env.	-20°C to +50°C, IP65
LTE band	3400–3800 MHz (B42/43) other bands on request
Transport mode	Routed (NAPT), bridged
User interface	Ethernet