

# Monitoring LTE networks in real time

Today, there are a number of LTE network operators throughout the world, and a good number of them have chosen to monitor their networks in real time using Polystar's OSIX monitoring system. OSIX is used to proactively manage the introduction of new access technology in conjunction with a large set of new services and applications, all based on the high transmission speed and capacity provided by the LTE technology. Using a solution based on Polystar's OSIX system, these operators have expanded their previously installed monitoring systems and added support for 4G/LTE, in addition to already supported technologies such as 2G, 3G, IMS, and PSTN/ISDN.



## Maintain service quality—even during aggressive system expansion

When new technology is introduced to the market, it is essential that the experienced service quality is not negatively affected in any way. At the same time, ensuring a consistent service quality towards the customers is extremely challenging, as several new elements are introduced simultaneously: a new core network (EPC-Evolved Packet Core), a new radio access network (LTE, a.k.a. E-UTRAN), and a large set of new devices (4G modems, smartphones). Adding to the complexity is of course the desire for a fast rollout to increase market share.

Adding to the high demands, mobile customers have grown accustomed to having well-functioning mobile data services, such as mobile broadband and streaming services. With the introduction of LTE/4G, customers' demand for higher data speed and reliability will increase even further. There is no room for problems, as the market will simply not accept questionable service quality from a network. Customers will quickly switch to operators that do deliver the quality of service they require, and they will also immediately spread the word in the market. "First impressions last"—there is a tremendous power in that old saying.

More complexity is also added when deploying a multi-vendor environment, which today is more the rule than the exception, as it increases the risks of incompatibility when tuning the network.

Polystar's monitoring equipment provides early-warning indications and helpful visualisations of any trouble in the different parts of the network, ensuring excellent quality and a seamless integration of the new LTE/4G networks. Building an LTE/4G network using Polystar's LTE/4G monitoring solution from the start will minimise the risk of experiencing problems and give you a flying start in the launch.



Celebrating the first years and the longest LTE experience in the monitoring industry.



The interest in our LTE capabilities has been extremely high, as we have the longest experience in the market.

Jonas Petersson, Product Manager Polystar

The Polystar OSIX system is proactively used by operators to ensure that any problem in the LTE network can quickly be identified, and later on isolated and resolved, even before end users become aware of the problem. Furthermore, once a problem has been identified, the OSIX system provides state-of-the-art tools for advanced troubleshooting.

Technical information on the next page



### Interfaces/protocols supported by the OSIX system

- S1-MME (S1AP)
- S1-U (GTP-U v1)
- S11 (GTP-C v2)
- S6a (Diameter)
- S5/S8 (GTP-C v2)
- DNS (NAPTR, SRV & A)
- X2 (X2AP)
- Rx (Diameter)
- Gx (Diameter)
- The NAS protocol (TS 24.301) incl. support for ciphering (EEA1, EEA2)
- SGs (SGsAP)



Over the past years, Polystar has signed a number of new deals on monitoring systems for LTE networks. Several systems are already in full operation.

### Ready for VoLTE

Over time, LTE networks will also be used for carrying voice traffic (today the LTE network is primarily used for mobile internet access). The GSM Association announced the VoLTE (Voice over LTE) initiative in February 2010, and associated specifications are currently being developed by 3GPP. Using our long experience in monitoring mobile networks, both for voice and data, the OSIX system is ready to support voice over LTE networks when available.

### The Polystar difference—one system for all technologies

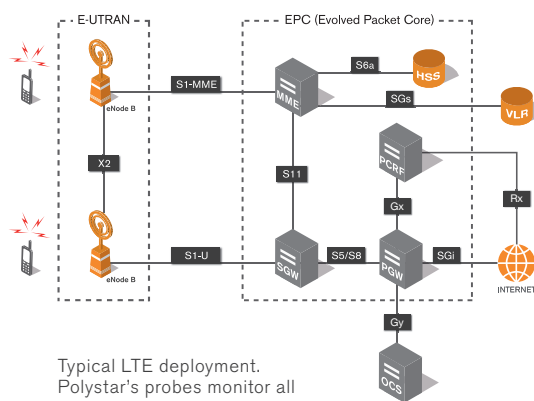


To gain a holistic view of the service quality in the network, it is essential to capture information from several network technologies. OSIX can monitor 2G, 2.5G, 3G, IMS, as well as 4G (LTE), all in the same system. This gives operators a complete picture of the service quality, while fully exploiting investments already made.

To be truly useful as information, data must be digested, organised, and displayed. In many respects, having millions of rows of unstructured data is no real improvement over having no data at all. Polystar provides the solutions that make important data visible and usable—quickly and efficiently.

### Why Polystar?

Polystar is a privately held company with close to three decades of experience in the telecom industry. Free from the constraints of quarterly financial objectives set by the requirements of shareholders, Polystar can look long-term and develop relationships and solutions for tomorrow, not just today—which in turn keeps us profitable. Polystar is an innovator in the mobile service assurance industry, and we are committed to supporting operators worldwide in their migration to LTE.



Typical LTE deployment. Polystar's probes monitor all interfaces in the figure.