



Brochure

Next Generation Service Assurance: LTE

Master complexities to enhance customer experience and control profitability with end-to-end insight into LTE environments

Operators around the world are scrambling to deploy LTE to enhance customer experience, alleviate bandwidth strain, fill in service gaps and drive profitability. By providing a complete understanding of complex and fluid environments, Empirix helps operators preempt issues, assure networks perform optimally and predict ways to enrich the mobile experience. We offer greater control over customer experience, operating costs, and revenue opportunities.

Empirix: End-to-End Analysis of the Complete Mobile Experience

Empirix offers a single architecture for monitoring voice, video and data quality no matter how a customer accesses the network or service is delivered. Now operators can streamline support operations and significantly reduce costs.

The Empirix Advantage

- Understand end-to-end customer experience, network performance, interoperability, service quality and application performance
- Correlate user, control and transport plane data to reveal true Quality of Experience (QoE)
- Ensure VoLTE communications including LTE-IMS connectivity, circuit switched fallbacks and integration with existing 3GPP and CDMA 2000 systems
- Monitor voice, video and data QoS in a single solution
- Analyze the performance of applications in the mobile network (IPTV, web, email, P2P, WAP, IM)
- Validate links evolution, handovers and interoperability across multiple environments
- Troubleshoot issues across both circuit and packet switched networks
- Monitor mixed 2G/3G/4G environments from end-to-end, including radio analysis, network and IP Core
- Integrate with NMS, OSS and other systems for advanced customer, network and operational analytics

Empirix E-XMS Service Assurance

Continuously ensure a great customer experience

Reduce revenue leakage

Speed Time to Understanding with complete insight into complex environments

Accelerate deployment of new LTE technologies

Ensure interoperability between LTE and IMS, 3GPP and CDMA 2000 infrastructures

Reduce costs by monitoring voice, video and data services in a single solution

Validate Quality of Application (QoA) across the entire mobile network

Integrated with Empirix xCentrix Analytics

Actionable intelligence derived from the correlation of:

- Empirix monitoring feeds
- Third-party NMS
- External data sources
- Multiple data points

More than 3,500 built-in KPIs

Multidimensional analysis and more

Unmatched powerful drill-down capabilities for root cause analysis

Trend analysis for strategic decision making:

- Planning
- Marketing
- Support
- Revenue creation
- SLA validation

End-to-End Service Assurance: Comprehensive View of Heterogeneous Mobile Networks and Services

No matter how LTE is deployed, Empirix provides a single solution for end-to-end monitoring of the entire mobile network. It correlates Quality of Service (QoS) and Quality of Experience (QoE) data for voice, video, and data services to report a more meaningful metric: Quality of Application (QoA) as experienced by customers. It also validates all the transport, handoff, connection, and data transfer events that enable mobile communications.

Voice over LTE

Unlike earlier IP technologies, there are several methods for delivering voice services with LTE technologies. Some are choosing to migrate legacy voice services to the VoIP/IMS Core while others are routing voice traffic to other parts of the network. Whether operators choose to deploy VoLTE via IP Multimedia Subsystem (IMS), Circuit Switched Fall Back (CSFB) or Single Radio Voice Call Continuity (SRVCC), they need a complete view of the network to fully assess customer experience.

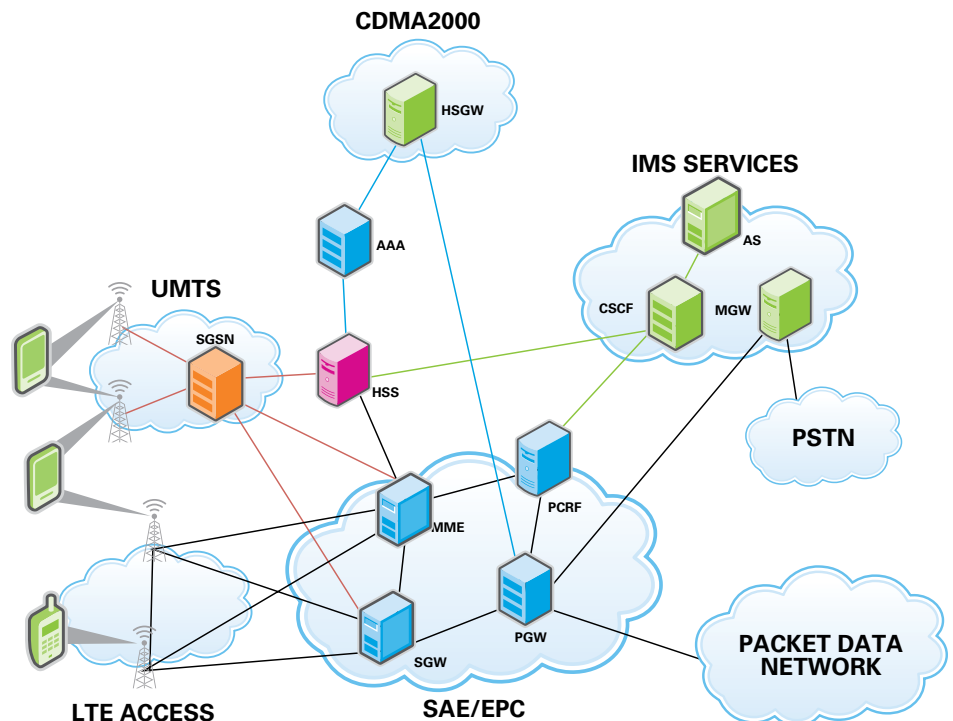
Empirix provides a fully integrated analysis of voice services, whether in IMS core, EPC, or Access network. Empirix supports multiple methods for transporting control and user plane data including Signaling Compression (Sigcomp). This data is fully correlated with an end-to-end analysis of call setup, real-time transport protocol (RTP) and codecs such as Adaptive Multi-Rate Wideband (AMR-WB).

VoLTE analysis can easily be added to Empirix MBB Service Assurance solutions via a simple software change. In this way, Empirix provides a solution that can easily scale with an operator's LTE deployment schedule - and equally important - budget.

Assurance from Design to Production

Whether companies are managing fixed broadband replacements or new service deployments, network rollout projects are extremely complex and fraught with delays. Empirix provides assurance for every step of the way:

- Deployment - monitors LTE network interoperability with all connection points
- User Trials - assesses services, throughput and latency in "mini" production environments
- Production - quickly detects issues that impact customers in full commercial operations



Empirix MSP

Empirix multi-service probes interface with monitoring points and capture data in a distributed system, thereby reducing the time, cost and complexity of filtering, grouping, analyzing and aggregating results per site. Empirix probes span legacy, LTE, control, user and security plane analysis in a single solution, requiring only software licenses to add more protocols, services or capabilities.

- Deploys for stand-alone analysis or part of a centralized, end-to-end monitoring solution
- Delivers alarms and results by FTP, syslog, SSH, or direct database TCP connection
- Includes a web-based GUI
- Stores results, alarms, KPIs and raw data in PCAP format on local storage
- Delivers packets and frames when required
- Synchronizes information to guarantee the same frequency, phase and absolute date and time

- Stores data, aggregates results from the different sites and provides network-wide trends and reports
- Manages operator authentication and secure user access according to privacy rules
- Interfaces with other NMS to export data and results

Empirix xCentrix

The Empirix solution provides actionable information to enable smarter decision-making - from the control room to the board room.

- Transforms hidden trends into plain view
- Includes pre-packaged KPIs and reports to save weeks of development time
- Offers slice and dice measurements
- Includes powerful visual and analytical tools to easily manipulate views of the large underlying database

Flexibility by Design and Concept

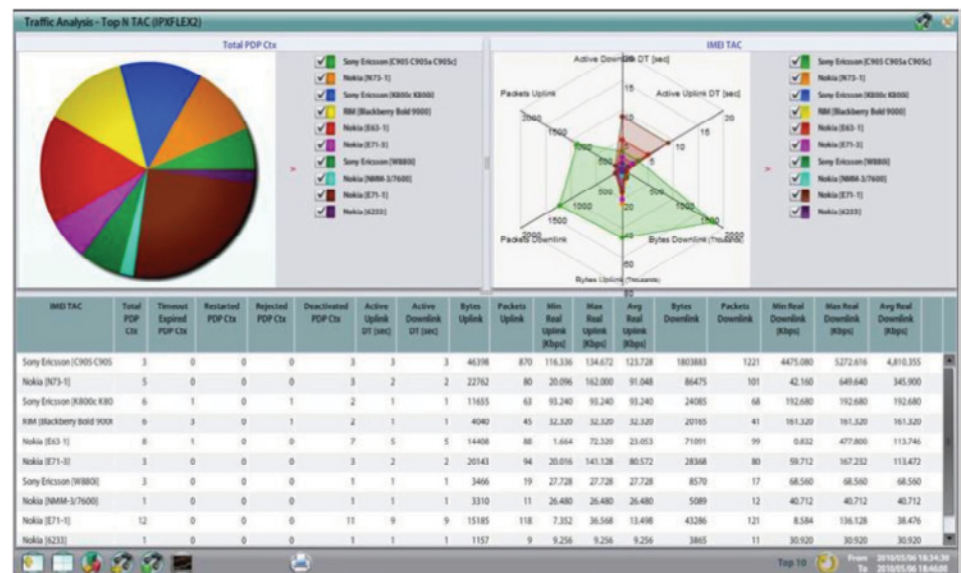
By standardizing on a single yet comprehensive service assurance architecture, operators can lower costs, reduce support issues, better manage infrastructure growth and improve customer experience across all services.

Empirix helps operators speed Mean Time to Understanding. Empirix E-XMS pinpoints the source of problems, even in the most complex environment, and provides actionable information for correcting them. Having the right information at the right time is crucial for continuously ensuring a great customer experience.

Empirix E-XMS

Empirix offers centralized, network-wide management solutions that can serve multiple departments, users and goals.

- Includes a server, with built-in storage and database
- Provides the network-wide view of the different services monitored by the probe
- Collects results and detail records from the remote Empirix probes



The Empirix Advantage: Application Service Detail Records

Empirix provides the most comprehensive view of communications events because the solution was designed for powerful data collection, correlation and analysis. The Empirix probe offers a single collection point for detailed information from the network, transport, signaling, services and user layers. The Empirix management and analytical software keeps all these data points fully correlated yet infinitely manageable. In this way, the Empirix solution can roll up information to expose trends and bandwidth issues or drill down to the smallest detail for accurate root cause analysis. For example, operators can understand how evolving control plane sessions are effecting the user plane and transport plane sessions, to easily identify at which layer there could be network bottlenecks or bandwidth leakages.

This powerful solution is also highly flexible, as it has a truly distributed monitoring system. Empirix offers multiple probe designs and management packages. More importantly, new protocols and services can be added through a simple software upgrade or system probe in the case of portable deployments. Therefore, the Empirix MBB Service Assurance solution can easily evolve with your network, continuously assuring a great customer experience as infrastructure expands to meet demand.

Capabilities

Empirix products offer simultaneous analysis of different protocols over multiple interfaces and technologies:

Key Interfaces:	S1, X2, S2a, S3, S4, S5, S6a, S6b, S8, S10, S11, S12, SGi, STa, SWa
Network Protocols:	GTPv1, GTPv2, Radius, Diameter, S1AP, X2AP, GRE, PMIPv4, PMIPv6, TCP/IP
Application Analysis:	Web, P2P, IM, Mail, FTP, Video, Voice (IMS), OTT
Network and Service KPIs:	Extensive list includes Per User, Per Service, Per Network Element, Per Application, Per Device (Searchable, flexible filters allow rapid drill-down into a single user's experience)
Application Specific Detail Records:	Contains a mix of Call Detail Records, IPDR and KPI results

For a complete list of offices worldwide, or to find an authorized distributor in your area, please visit: www.empirix.com/contactus.

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