



# VoIP and VoLTE QoE Analysis

## Analyze QoE for high-value voice traffic



Sandvine's network intelligence and service innovation capabilities can be

leveraged in 5G core and edge environments, delivering critical contextual and slice awareness to feed new service creation and strengthening a service provider's position in the 5G value chain for consumer and enterprise markets.

### VOIP AND VOLTE QOE ANALYSIS BENEFITS

- Analyzes true performance of voice services with high-granularity of measurements
- Addresses QoE visibility for all types of SIP-based VoIP, VoLTE, and VoWiFi technologies
- Ensures voice traffic is prioritized appropriately by identifying resource starvation issues by network locations, allowing service providers to adjust network policies
- Aggregates network-wide key performance indicators (KPI), providing the necessary depth and breadth of service quality
- Calculates QoE scores for all the critical application categories and provides the capability to dig deeper into voice-related services most susceptible to quality issues

### MARKET OVERVIEW

With the proven cost and technical benefits of VoLTE deployments (faster call set up times, HD voice, and seamless handovers), many service providers are attempting to use VoLTE as a competitive advantage, but are challenged with understanding the delivered quality of experience (QoE).

At the same time, disruptive OTT applications pose a threat to service providers' traditional voice and SMS revenues. VoLTE services offer service providers new revenue opportunities in the form of IMS-based, rich multimedia services, but only if these services are differentiated and are able to deliver a superior QoE compared to OTT applications.

In spite of the benefits, leading service providers are experiencing major challenges deploying VoLTE. Specifically, when VoLTE services are launched with limited spectrum and network capacity, optimal QoE is hard to maintain. Even if the initial launch performance is good, due to low volume, there are no guarantees that QoE-related issues will not surface when call volume rises, without investing heavily on backhaul capacity. Compounding the problem, existing 3GPP architectures provide no metrics for service providers to understand LTE performance and delivered QoE.

Due to high associated costs, most service providers conduct very limited drive-testing for VoLTE/VoIP QoE and without this testing data, they do not have an end-to-end view of service quality issues experienced by users.

When service providers have insights into end users' experience and network-level performance, including metrics by plan, device, and protocol, they are empowered to make quick and accurate decisions.

### USE CASE OVERVIEW




**Sandvine's VoIP and VoLTE QoE Analysis use case offers network-wide, call quality insights, complementing traditional operational metrics with an approach that shines a spotlight on VoIP service performance and monitors the VoLTE experience of network users.**

This use case uses granular metrics and a unique scoring algorithm based on MOS Listening Quality, MOS Conversational Quality, and Nominal MOS per call for both the subscriber (calling) and peer (called) legs to determine the overall VoLTE QoE score. Enriched with contextual data such as location, network data, devices and application data, service providers can monitor the network, individual users and groups, and devices with the perspectives of VoIP and VoLTE QoE.



Figure 1

Context is key for QoE – understanding location and devices as well as the QoE achieved by competitive VoIP services is a significant differentiation for Sandvine’s VoIP and VoLTE QoE Analysis

|  Network   |  OTT VoIP   |  Devices  |
|---|--|--|
| <ul style="list-style-type: none"> <li>• Visualize performance of VoLTE across the entire network</li> <li>• Troubleshoot areas with poor voice quality and identify root cause</li> <li>• Pinpoint areas of maximum impact to bad VoLTE QoE</li> </ul> | <ul style="list-style-type: none"> <li>• Compare call quality between service providers, VoLTE cells, and other OTT applications</li> <li>• Use OTT analytics to identify popular OTT VoIP services and penetration</li> <li>• Gain insights into the most popular OTT VoIP services and usage patterns</li> </ul> | <ul style="list-style-type: none"> <li>• Benchmark devices based on VoLTE usage patterns and call quality</li> <li>• Identify poor performing devices in the network and their potential impact on the network</li> <li>• Use device analytics to identify popular VoLTE and VoLTE devices and penetration in the network</li> </ul> |

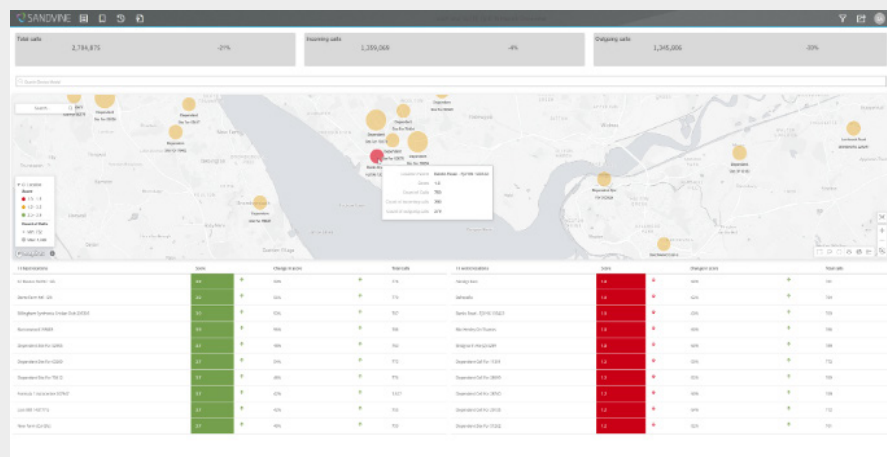
**VoIP and VoLTE QoE Analysis:**

- Provides insights into VoLTE, VoWiFi, and SIP-based VoIP solutions
- Monitors both control plane (SIP signaling) and data plane (voice media/RTP) traffic in order to generate VoIP-related metrics for calculating QoE as well as other performance KPIs
- Enriches metrics with contextual awareness (e.g., device, location, and plan) and correlates with QoE scores
- Isolates segments of poor call quality
- Identifies problem areas, enabling maximum ROI on CAPEX
- Offers both network-wide QoE and location-specific QoE
- Stores data in Insights Data Storage
- Displays intelligence via the Active Network Intelligence Portal with custom reporting

Figure 2

**VoIP and VoLTE Network Overview**

Top 10 best and worst performing locations, based on QoE, for faster resolution of QoE-related network issues



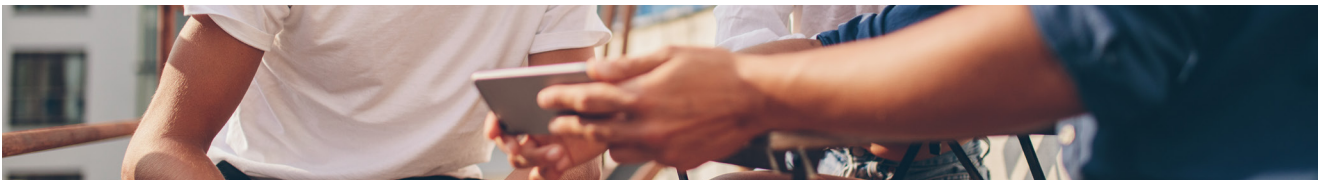
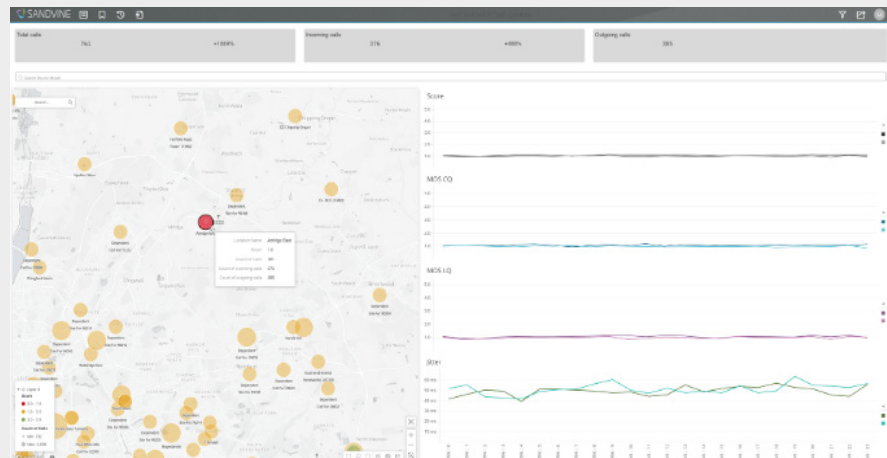


Figure 3

## VoIP and VoLTE Network Locations

Determine if a problem is widespread or isolated to a particular location



Sandvine's VoIP and VoLTE QoE Analysis use case addresses the requirement to understand, isolate, troubleshoot, and fix VoIP and VoLTE performance by providing full network visibility and QoE scoring.

## ABOUT SANDVINE

Sandvine's cloud-based Application and Network Intelligence portfolio helps customers deliver high quality, optimized experiences to consumers and enterprises. Customers use our solutions to analyze, optimize, and monetize application experiences using contextual machine learning-based insights and real-time actions. Market-leading classification of more than 95% of traffic across mobile and fixed networks by user, application, device, and location creates uniquely rich, real-time data that significantly enhances interactions between users and applications and drives revenues. For more information visit <http://www.sandvine.com> or follow Sandvine on Twitter @Sandvine.



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