

 Case study

Smartphone-specific network testing:
reflecting true consumer experience



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Accuver assists the Korea Communication Commission (KCC) in the world's first smartphone-specific network testing at a country-wide level, providing an accurate assessment of end-user perceived quality to assist KCC in delivering the optimum voice call experience for consumers.

Improving the quality of voice calling on smartphones

Mobile network testing and optimisation has been a priority since mobile phones were first introduced; yet when smartphones arrived they were not met with new, more appropriate methods of network testing. After a growing number of consumer complaints regarding poor call quality on smartphones, the KCC recognised the need for smartphone-specific network testing on a country-wide level in order to effectively measure the end-user experience and therefore assist carriers to improve their network quality. To do this, KCC brought the Telecommunication Technology Association (TTA) and Accuver onboard to carry out this important testing.

The tests had to focus on measuring the voice call quality and dropped-call rate, as these issues are paramount to delivering the best possible service to mobile users, and covered:

- Smart phone voice calling
- 3G data devices
- WiFi connectivity
- WiBro (Wimax)
- High speed data internet
- IPTV

As the proliferation of smartphones and the use of data-based services continues to increase year on year, there is enormous pressure on vendors and operators to collaborate in order to conduct more valuable tests that will help to ensure consumer satisfaction. With an investment of approximately \$1.6M into nationwide smartphone-specific network testing, the KCC was pioneering an important project that would stand as a benchmark for others to follow.

Real-world smartphone-specific network testing

As one of the leading wireless network optimisation solutions providers, Accuver was appointed by the Telecommunication Technology Association (TTA) to assist with KCC's groundbreaking country-wide smartphone-specific network testing. Specifically, TTA selected Accuver's XCAL-MO and Bluetooth test solution to provide full performance benchmarking data.

The XCAL-MO solution is a hardware platform for network benchmarking that allows users to connect up to twenty handsets and automatically make calls to the network. The subsequent data can then be recorded and used to calibrate and optimise overall network performance. The key benefits of Accuver's XCAL-MO platform are its scalability, ease of use and compatibility with all major technologies, handsets/CPEs, and integration with XCAP for feature-rich post-processing of data, root-cause analysis and reporting.

SK Telecom, KT and LGU+ networks were tested using the two most popular smartphone models from each mobile carrier to measure the call success rate of each, to determine the causes of dropped calls, and to provide a full call quality assessment. The tests also spanned a wide geography in order to give a deeper understanding of actual voice quality issues experienced by real consumers.

Accuver's XCAL-MO used automated test scripts and scheduled calling to measure key data points, including: RAN data, physical/MAC layer information, layer 3 and MAC management messages, as well as higher layer protocol messages including TCP/IP. This information was then mapped in realtime to provide a powerful geospatial visualisation of the data, and was simultaneously recorded.

Analysing real-world performance to identify and fix bottlenecks

The test results showed that the overall voice call success rate for mobile to mobile calls (98.7%) was better than that of smartphone to smartphone calls (97.6%).

Overall results breakdown:

Mobile to Mobile	Mobile to Smartphone	Smartphone to Smartphone			Average total
		Average	Only Voice call	Whilst using data	
98.7% success rate	98.6% success rate	97.6% success rate	98.3% success rate	97.2% success rate	98.0% success rate

The geographical breakdown revealed significant differences in performance based on location:

Residential	Suburbs	Downtown	Highway	Average total
98.1% success rate	98.1% success rate	97.8% success rate	96.2% success rate	97.6% success rate

The geographical breakdown revealed significant differences in performance based on location:

KT		SKT		LGU+	
Smartphone A	Smartphone B	Smartphone A	Smartphone B	Smartphone A	Smartphone B
96.9% success rate	95.9% success rate	98.7% success rate	98.3% success rate	98.1% success rate	97.8% success rate

Ultimately, the results showed that there is significant room for improvement of voice calling on smartphone devices. As an independent project, these tests were able to provide an objective view of the current 'best network for voice quality' using a specific smartphone and to make recommendations to operators on how they can improve performance.

Setting the benchmark: Greater collaboration on nationwide test projects

Following this project of smartphone-specific network testing, KCC concluded that if Asia is to improve smartphone call quality then joint efforts must be made between mobile carriers and manufacturers to build appropriate smartphone-specific testing into all network performance improvement programmes. KCC is constantly monitoring the carriers in South Korea in order to improve the unsatisfactory results and to stay on the front-foot when developments are made new devices are introduced.

Accuver firmly believes that KCC's smartphone-specific network testing initiative is a flagship project that ought to be replicated throughout the industry. Fine-tuning networks should be based on the most accurate data available, tested for real end-user impact, and then the results of these tests used as the basis for further improvements. If the industry is to have an open and objective dialogue about the cause, effect and potential fixes for wireless network performance troublespots, then operators and vendors must not rely simply on high-level data, instead utilising data that reflects real end-user experiences with the highest level of accuracy.

"The entire mobile industry and its consumers would benefit from more appropriate testing initiatives being brought in as standard. We have cutting-edge test and measurement solutions at our disposal, capable of delivering highly detailed information based on real-world performance. However, the uptake of nation-wide, collaborative projects such as those carried out in Korea has been disappointing to date.

"Operators need more intelligent and cost effective ways to troubleshoot and fix bottlenecks in their networks. For example, through crowd-sourcing and other cost-effective methods of subscriber-based data collection on smartphones. Ultimately, basing network and service improvement programmes on the richest and most appropriate data available will lead to greater end results."

Myungsup Kim, CEO, Accuver

At an industry level, further smartphone-specific testing would help to establish whether or not networks have a smartphone-based threshold beyond which there will be a permanent degradation of quality. If such a limit exists, the ability to accurately model and forecast it would have a significant impact on the market.

Read our news announcement calling for industry collaboration here:
www.accuver.com/news-8

'Wireless network testing must reflect real-world usage'

Accuver calls for nationwide smartphone-specific network testing and a focus on user-perceived quality

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