U900 & 4.5G

The perfect match for Turk Telecom

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Mobile operators want to quickly boost mobile broadband (MBB) coverage, ramp up user experience, and accelerate ROI. The UMTS 850M/900M (U900) ticks all three boxes, explaining why U900 deployment is on the rise on a global scale. Turk Telecom is a example of telcos who have deployed U900 and respectively made gains in 4.5G, 900 MHz, and high-interference scenarios.

By Zhang Yu

On April 1, 2016, Turk Telecom announced the nationwide commercial launch of 4.5G with two other major Turkish operators, kicking-off a high-speed MBB development phase in the nation of nearly 80 million.

After acquiring the 900 MHz spectrum, Turk Telecom teamed up with Huawei to commercially deploy its U900 network. U900 uses a low-frequency 3G band that delivers outstanding network performance in the areas of 4.5G voice fallback, MBB coverage, and data service experience.

Hi U900, meet 4.5G

Turk Telecom's 4.5G network uses the 800, 1800, and 2600 MHz frequency bands, as well as the UMTS 2100 MHz band U2100 and GSM 1800 MHz band G1800.

VoLTE services haven't yet been rolled out to most of Turk Telecom's 4.5G terminals, so the operator's 4.5G users fall back to UMTS or GSM networks to make or take calls. Falling back from 4.5G low-frequency bands to high-frequency GSM and UMTS bands can lead to fallback failure due to differences in signal coverage. U900 provides the perfect solution, giving the same coverage as 4.5G 800 MHz.

Rolling out U900 has also helped Turk Telecom solve MBB coverage and user experience issues caused by too few 3G base stations, enabling the operator to build a better MBB service experience.

Fast U900 overlay

In 2015, Turk Telecom began modernizing its 2G and 3G networks. With Huawei building the core areas, the operator also started on its new 4.5G network, the construction of which needed to be fast to keep pace with its competitors.

The U900 network's role was to keep the MBB service experience consistent between

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its 3G and 4.5G networks, for which Huawei proposed a two-step network construction solution. The 4.5G and U900 networks would be constructed first, and then overlaid on the existing U2100 network, which another vendor was deploying. This would be followed by the step-by-step completion of the comparatively complex and time-consuming U2100 transformation.

Huawei overcame Turk Telecom's concerns about the U900 regarding load control on the overlay network and Iur interface compatibility with two strategies: a customizable anti-ping pong networking strategy, and a preferred carrier residence strategy. These strategies would reduce the impact of interoperability issues on network loads like signaling interworking and RNC reselection. Huawei's two-way Iur interface policy covered the other vendor, ensuring user experience and compatibility.

Test results showed that Huawei's overlay network solution enabled main services and processes to operate normally in terms of compatibility, dispelling Turk Telecom's concerns over Iur interface compatibility.

Overlay for better MBB

Deploying the U900 resulted in outstanding network performance in Istanbul. 4.5G voice fallback was three seconds lower than G1800, and data connections could be maintained for simultaneous voice and data fallback, greatly increasing user experience. The coverage signal was boosted by more than 9 dB across the whole 3G network; for data services, downloads for 3G users increased by 1.3 Mbps, a 50 percent jump. Lur interface compatibility was normal, with no ping-pong switching.

Turk Telecom now had a competitive advantage in the Turkish MBB market.

The global number of U900 networks has continued to rise. As of Q3 2016, 217 of these networks had been commercially launched around the world, among which 155 were built by Huawei. The growing number of networks shows how operators are improving user experience by deploying the U900 solution to boost MBB coverage. And with MBB growing in popularity around the world, this number will continue to soar.