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Performance Evaluation and Optimisation of JAWWAL 3G Mobile Network

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Abstract

In this paper, a comprehensive research study is carried out on the performance evaluation and optimization of the JAWWAL 3G mobile network in Palestine. Particularly, we present a case study on the planning, evaluation, optimization, and implementation of a 3G mobile network in Idna village, Hebron city, Palestine. The 3G mobile network performance is evaluated by using the so-called drive test through the key performance indicators (KPIs). After a driving test was conducted in the region, the initial network analysis and evaluation showed that the network coverage ratio is 21.5%, the network service quality ratio is 11.1%, the downlink throughput ratio is 6.1%, and the uplink throughput ratio is 35%. Based on these ratios, which are considered to be poorly evaluated, the area lacks coverage and quality of the network service. To overcome these drawbacks, we propose to plan and implement a new cell site in this area. Accordingly, after the planning and construction of the new cell site, the network has been analyzed and evaluated through a driving test. The results show considerable improvement in all KPIs. Indeed, the network coverage ratio is increased to 58.7%, the network service quality ratio is increased to 61.1%, the downlink throughput ratio is increased to 69.5%, and the uplink throughput ratio is increased to 74.5%.