The Impact of Cell Capacity on WiMax Network Performance

Abstract

In the communication sector, the main objective is to compromise quality and cost. Wireless Access Technologies act as the best serve these objectives, since they are easily deployed and capable of reaching and serving customers everywhere in a cost effective way. In this paper, we examine the communication options, and account for a country's geography to propose optimal WiMax planning keeping in mind the delay and throughput concerns that are inherent in wireless communication. To perform WiMax radio network planning, we use a network simulation tool called opnet. Our approach offers all users a minimum bandwidth of 1.4 Mbps as well as a coverage that exceeds 90% for all indoor users in the area under study. We optimize the network by iteratively minimizing the number of base stations required, and equivalently minimizing the cost, while maximizing the coverage for the subscribers. The paper also analyzes the impact of capacity on the performance of WiMax. More specifically, we use well-known simulation software called opnet to simulate a WiMax environment under different applications scenarios. And analyze the results to determine the impact of the added more subscribes stations on the data rates between the base station(s) subscribers. The results of our study showed that efficient deployment and coverage plans could be achieved for big cities as well as for rural areas.

KEY WORDS: WiMax planning; OPNET