

Abstract

The availability and reasonable cost of broadband Internet made it an attractive and favorable option to billions of users worldwide. Being a fast service also encourages its users to use multimedia applications. The performance of such applications in wireless LAN may be highly affected by security protocols. This paper examines the effect of different security protocols on the performance of wireless LAN with multimedia applications. Experiments were performed on a wireless test-bed and the results were analyzed for throughput, delay and jitter for four security settings: disabled security, WEP, WPA1, and WPA2. The experiments were performed under two different scenarios and using multimedia traffic streams. The results revealed a significant degradation in performance when security protocols were enabled in wireless LAN. Specifically, delay and jitter, were significantly increased, both of which are key metrics for multimedia applications. The increase is clearer when a larger number of hosts exist in the network. We finally propose an outline for a solution to obtain strong security in wireless LAN without significant performance degradation. The solution proposes that the security processing at the hosts be conducted by the powerful host processor rather than by the radio card processor. As for the wireless access point, adding ASIC or FPGA processor is suggested for performing the heavy security processing.