

# **Performance Evaluation Of Vertical Handoff In Fourth Generation (4G) Networks Model**

## **Abstract**

The next generation 4G wireless networks is envisioned as a convergence of different wireless access technologies providing the user with the best anywhere, anytime connection and improving the system resource utilization. The integration of Wireless Local Area Network (WLAN) hot spots and cellular networks (such as GPRS and UMTS) needs a more efficient handoff process. Handoff process between WLAN and cellular networks is known as vertical handoff. In this handoff process, number of unnecessary handoff should be minimized and WLAN network should be given high priority. The main objective of this paper is to study and evaluate the handoff process between WLAN and cellular networks using two algorithms. The algorithms are based on received signal strength, WLAN threshold value and lifetime estimation. Then, simulation model are developed to evaluate the performance of the vertical handoff algorithms using MATLAB. The performance is evaluated according to the number of vertical handoff, number of unnecessary handoff and handoff delay by varying the user mobility rate. Simulation shows that the number of vertical handoff is increasing as the user mobility rate is increasing. Handoff algorithm using received signal strength (RSS) averaged and lifetime estimation shows the minimum number of unnecessary handoffs as compared to algorithm using only RSS averaged. The result also shows that the handoff delay is affected by the user mobility rate. Slower mobility rate user tends to stay longer in WLAN network as compared to high mobility rate user.

## **Author Keywords**

Cellular networks; Handoff delay; RSS; Vertical handoff; WLAN