

# WPBR: Weekly Prediction based Bandwidth Reservation Scheme for Macrocellular Wireless Networks in Urban Areas

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**Abstract**—One of the major challenges in the cellular networks is to guarantee the quality of service of the ongoing calls by prioritizing them over the new calls. An operative approach to prioritize the hand off calls over the new calls is by reserving bandwidth for the ongoing calls of mobile stations in the potential next cell that they may visit. Improving the prediction of potential next cell that a mobile station may visit will cause better bandwidth utilization. In this paper, we propose weekly prediction based bandwidth reservation scheme. The proposed scheme, WPBR, improves prediction by means of storing weekly movement probabilities of mobile station based on Markov modeling techniques. In order to decreasing the storage space that is needed for storing the mobile station's movement probabilities, we adopted a dynamic hashing approach. Simulation results show that the weekly prediction in the proposed scheme, significantly improves bandwidth utilization, and the adopted dynamic hashing approach caused the overhead of storage space to be acceptable.

**Keyword**— Macro-cellular Wireless Networks, Bandwidth Reservation, Mobility Prediction, Markov Modeling Techniques, Dynamic Hashing



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