A Prioritized Uplink Call Admission Control Algorithm For 3G WCDMA Cellular Systems With Multi-Services

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Summary

The 3G cellular mobile systems which are based on WCDMA technology are expected to be interference limited. Soft capacity is one of the main characteristics of 3G (i.e, UMTS) and it requires new radio resource management strategies to serve diverse quality of service requirements. In this paper, a WCDMA prioritized uplink call admission control (CAC) algorithm for UMTS, which combines QoS negotiation and service differentiation by priority, is studied. This CAC scheme gives preferential treatment to high priority calls, such as soft handoff calls, by reserving some bandwidth margin (soft guard channel) to reduce handoff failures. In addition, queuing is also used to enhance the handoff success probability. The algorithm uses the effective load as an admission criterion and applies different thresholds for new and handoff calls. Finally, the study considers two types of services: voice and data calls. Results indicate that this algorithm reduces the drop handoff calls and increases the total system capacity; hence the GoS and the system performance can significantly be improved especially in case of high mobility environments.