A NEW POWER SAVING MECHANISM WITH PERIODIC TRAFFIC INDICATIONS IN THE IEEE 802.16E

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A new sleep mode scheme called the power saving mechanism with periodic traffic indications in the IEEE 802.16e. In the proposed scheme, traffic indication(TRF-IND) messages are regularly sent at every constant time to initiate transmission, and the bandwidth and energy can be saved by not sending sleep request(MOB-SLP-REQ) and sleep response(MOB-SLP-RSP) messages which are required in the original power saving classes in the IEEE 802.16e standard. We obtain sleep mode ratio and power consumption ratio by computing the Laplace Stieltjes transforms(LSTs) of the length of awake interval and sleep interval, and total delay by computing the LST of queueing delay. We show that our analytic results match with simulation results very well. Using our performance analysis we find the optimal system parameters such as a TRF-IND interval and a close-down time which minimize the power consumption of MS while satisfying the required quality of service(QoS) on delay. Finally we show that the proposed scheme performs better then the power saving class of type 1 in the IEEE 802.16e standard.