Asynchronous Hybrid Duty Cycle MAC Protocol for Wireless Sensor Networks

Abstract

Energy conversation is one of the primary objectives of duty cycle MAC protocols. Different synchronous and asynchronous duty cycle MAC protocols have been proposed in recent years. These protocols perform well under low traffic loads, but efficiency of these protocols degrade under high traffic loads. We present an asynchronous hybrid duty cycle MAC protocol called Hybrid MAC (H-MAC), which uses both sender and receiver initiated mechanisms to combat the packet delivery latency. In H-MAC each node schedules its sleep and wake up time based on cross layer routing information on the receiver initiated part and on the sender initiated part each sender chooses its wake up time based on the receiver's wake up information. We have evaluated H-MAC in diverse network under dynamic traffic loads. Experiments reveal that, H-MAC significantly reduces packet delivery latency and energy consumption compared to RI-MAC.


Index Terms

Computer Science  Wireless
Keywords

Sensor networks, idle listening, duty cycling