Maximizing the energy efficiency in MS-MAC using a dynamic approach

ABSTRACT

There has been an intensive research on a good MAC protocol design for wireless sensor networks with stationary nodes in which they all aim at making some wise trade offs between the network performance parameters and energy efficiency as the main design principle in WSN. But almost none of these MAC protocols, except a few, have addressed mobility in their structure which poses many new challenges to the MAC concept in wireless sensor networks. This paper collaborates on a little enhancement on MS-MAC, a mobility adaptive MAC protocol, in WSN. The MS-MAC protocol handles mobility by proactively increasing the frequency of the Sync period inside the active zone. However this increase is based on a static approach which forms the active zone with a constant value of R and appears to be problematic when the border node becomes mobile as well. In this paper we aim at optimizing the value of R by dynamically increasing or decreasing it according to the distance the border node takes from the border region. We expect that this dynamic approach increases the energy efficiency by preventing the nodes inside the virtual clusters going into the active zone unnecessarily but yet at the cost of an increased latency.

Keyword: Wireless sensor network; MAC; Mobility prediction energy efficiency; Active zone