ABSTRACT

Transmission Control Protocol (TCP) is the most popular and are the de-facto standard transport protocol for internet communication. TCP both with IP is one reason why the internet has become a big success story and nearly ubiquitous today. However there are still several issues which need to be solved, such us bringing TCP to be used in IEEE802.15.4 based Wireless Sensor Network (WSN). The greatest hurdle which hinders TCP from being widely adopted in IEEE802.15.4 based WSN is TCP's flow and congestion control mechanism[1]. TCP is unable to differentiate between a lost segment due to congestion and a lost segment due to wireless channel error and mishandling by doing windows halving (multiplicative decrease), TCP aggressive increase behavior on congestion avoidance phase also lead congestion occurs frequently due to low rate or limited bandwidth of IEEE 802.15.4 based WSN. To solve this problem, we propose enhancement on window growth function (addictive increase) and window decrease function (multiplicative decrease) of standardized TCP (Newreno) according to IEEE802.15.4 based WSN characteristic. We called this new TCP Scheme as TCP LR-Newreno which is an enhancement of TCP Newreno specific for wireless sensor network based on IEEE802.15.4 (LR-WPAN) standard. The research uses the simulation method by using network simulator-2 (NS2) as simulation software and the experiment result shows that the TCP LR-Newreno provides better performance for the test parameters comprising of Throughput, Data Drop Rate and Energy Consumption.

Keywords: Transmission Control Protocol (TCP), Wireless sensor network (WSN), IEEE

802.15.4, WPAN