



TERP: A Trusted and Energy Efficient Routing Protocol for Wireless Sensor Networks (WSNs)



Marwah Almasri¹ [Khaled Elleithy², Anas Bushang³, and Remah Alshinina⁴]

Abstract -

Recently, Wireless Sensor Networks (WSNs) have got researchers attention due to its various useful and helpful applications in the real world with low cost sensors. The task of the sensors is to collect data from the environment and send it to the central node (sink node). However, the power is limited in these sensors and therefore a limited lifetime which is a big deal in WSNs. Another important issue in WSNs is the level of security. Since these sensor nodes exchange and transmit data among the network, the security of the data can be at risk. Hence, in this poster, we propose a novel trusted and energy efficient routing protocol (TERP), which is based on the Destination Sequenced Distance Vector Protocol (DSDV). TERP can avoid any malicious nodes (untrusted nodes) and thus increase the security level in the network. Another advantage of TERP protocol is that it decreases the power consumption level through applying the trust factor. The trust factor scale from 0 to 10 is used, where 10 means that the node is completely trusted by another node. When the degree of trust is high, less encryption is needed and thus less energy is acquired. In addition, based on using NS-2 simulator, TERP with high trust level trust consumes less power compared to untrusted DSDV and low trusted TERP. Therefore, using TERP with high or medium level of trust can defiantly save a lot of energy and enhance the life of the whole network.

Furthermore, The efficiency of TERP protocol is provided based on several factors such as drop ratio, delivery ratio, average delay, and delay jitter, compared to DSDV protocol. All results have shown that TERP is performing better than the existing DSDV due to several reasons. First, using trust saves more power in the network. Second, TERP has lower drop ratio than DSDV which means better efficiency. Third, TERP has improved delivery ratio than DSDV protocol which is almost the double in the trusted scenario.

Keywords: Wireless Sensor Network (WSN); Destination Sequenced Distance Vector (DSDV); Trust; Trusted and Energy Efficient Routing Protocol (TERP).

¹ University of Bridgeport, 221 University Avenue, Tech 229, Bridgeport, CT 06604, maalmasr@my.bridgeport.edu.

² University of Bridgeport, 221 University Avenue, Tech 229, Bridgeport, CT 06604, elleithy@bridgeport.edu.

³ University of Bridgeport, 221 University Avenue, Tech 229, Bridgeport, CT 06604, abushnag@my.bridgeport.edu.

⁴ University of Bridgeport, 221 University Avenue, Tech 229, Bridgeport, CT 06604, ralshini@my.bridgeport.edu.