ENHANCED LIFETIME AND THROUGHPUT FOR DEEC PROTOCOL AND ITS DERIVATIVES USING SLEEP AWAKE MECHANISM IN WIRELESS SENSOR NETWORKS

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Abstract

Wireless Sensor Networks is an emerging technology nowadays. With its increasing demand, they are prepared in such a way to perform more complex functions. But they still require the battery operated sensors to perform the various tasks. As the energy of these sensor nodes is limited, so enhancing the network lifetime has become a challenging issue. Many approaches have been proposed till now; starting from DT technique to MTE technique, then origin of cluster based protocols, homogeneous protocols, heterogeneous protocols and so on. Although many methods have been proposed, but increasing the network lifetime is still one of the biggest issues in WSNs.

In this thesis, Sleep Awake mechanism is introduced to reduce the energy holes. Energy holes are created due to non uniform distribution of energy nodes in the network, some of the nodes drain out energy very quickly and consequently energy holes are created at few places in the network. These energy holes become the cause for data routing failure. Due to these holes, some of the areas in wireless sensor networks remain unattended. This makes WSN an ineffective network. In Sleep Awake mechanism, sleep nodes are used in the network to reduce the energy holes to large extent. When any node is in sleep mode, then its communication with the cluster head is ceased for some time. This may help the node to save its energy. Sleep Awake mechanism defines a threshold value for all the sensor nodes in the network. This threshold value decides that when the node will be in sleep mode and when it will be in awake mode. In this thesis, the Sleep Awake mechanism is applied on four heterogeneous protocols namely DEEC, DDEEC, EDEEC and TDEEC and then results are compared with these basic protocols. Simulations results showed that modified DEEC, modified DDEEC, modified EDEEC and modified TDEEC enhanced the network lifetime by 25.69%, 18.50%, 9.15% and 5.62% respectively and the throughput by 32.81%, 35.80%, 17.28% and 8.21% respectively as compared to DEEC, DDEEC, EDEEC and TDEEC.