# Survey of WSN Routing Protocols

Devika G., Government Engineering College, Rajasthan, India

Asha Gowda Karegowda, Siddaganga Institute Of Technology, Karnataka, India

Ramesh D., Sri Siddhartha Institute Of Technology, Karnataka, India

## ABSTRACT

Many original ideologies are being applied as a solution to the problem of wireless sensor network with the rigorous experimentation and advancement in technology and research. This article reviews various energy efficient routing algorithms, classifying them based on the methodology applied. The classification is based on the design approach used to solve the basic problem arising in the construction of a transmission path between a source and the base station [BS] with a minimum of energy consumed. The pros and cons of the routing algorithm for WSN in the stated architectures are analyzed. The parameters to be considered in the evaluation of all routing protocols are summarized.

## KEYWORDS

Architecture, Classification, Energy Efficiency, Evaluation, Wireless Sensor Networks

## 1. INTRODUCTION

Nowadays, how, how fast, how better we communicate data play a crucial role in world. As a part of it WSN is being applied to carry on faster communication as a lower cost and also from places which are unreachable from humans from varied devices in type and size (Iyengar, Prasad, and Min, 1995) (Pottie and Kaiser, 2000) (Kahn, Katz, and Pister, 1999) (Akyildiz et al., 2005). In WSN energy efficiency will be major concern of interest as sensor nodes are work through battery. The major part of interest of WSN is to sense and convey data with minimum power in order to captivate larger fruitful time of network (Woo and Culler, 2001). WSN are composed of nodes which will cooperate for each other in transmission of messages/data among neighbours to achieve task assigned to them. A typical sensor node and interconnection of them are shown in Figure 1.

In this paper, we have summarized and classified few energy-aware routing algorithms along with their design methodology. The rest of this paper included as follows. In section 2 a brief review of energy efficient algorithm is considered. The classification of routing algorithm is described in section 3. Evaluation parameters are described in section 4. In section 5, a brief review of various simulators is presented. Lastly, in section 6 a brief conclusion and enhancement is described.

## 2. ENERGY-EFFICIENT WSN ROUTING

Routing is a process of discovering an effective and efficient transmission path between nodes. The routing table may be built to store routing information for route maintenance or for future communications. In certain cases, it defines how one radio can pass message to another through intermediate radio nodes along the way to destination. Commonly Zigbee will be employed to connect, which is capable of handling several routing methods.

**Figure 1. A typical (a) sensor node (b) interconnection of sensors**
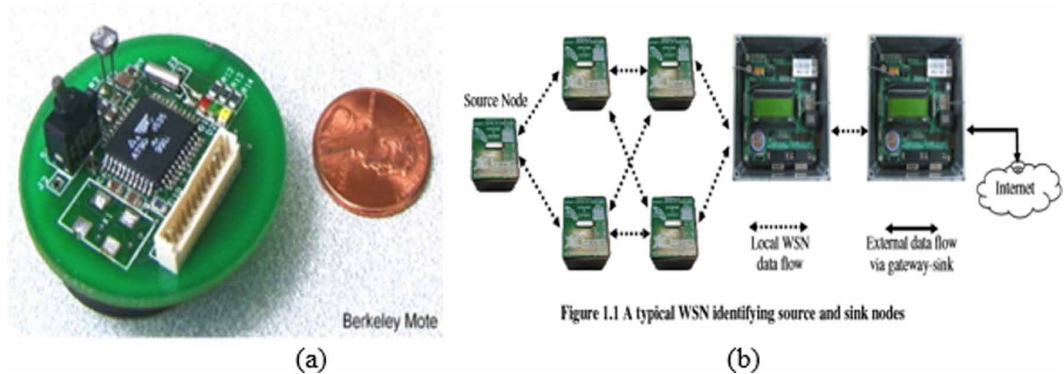


Considering routing challenges that arise in network, WSN aims at finding and maintaining routes with minimum level of energy. Routing algorithm in WSN need to explore route concerning to factors like accuracy, node deployment, heterogeneity, data reporting, scalability, data aggregation, transmission media, and quality of service (Akyildiz et al., 2005; Amish et al., n.d.).

## 3. CLASSIFICATION OF WSN ROUTING PROTOCOLS

A routing process is needed to select the best path(s) from the source node to the destination node. Routing may also be designed and optimized to support some specific requirements of applications and networks. These requirements include energy and bandwidth efficiency, quality of service, scalability, ad hoc support, throughput, mobility and reliability, see Figure 10. This will cause wide variation in requirements, which cannot be fulfilled by a single routing protocol.

Correspondingly, many different protocols are found, which have been designed to fit some specific requirements like ad hoc support and mobility. The classification of energy efficient algorithm is included in Figure 2.

### 3.1. Architecture

#### 3.1.1. Node-Centric approach

The major design concern of this routing communication is totally based on address node. All network nodes have an IP address which will be used in his approach. The routing process will be initiated or continued until the source and destination will know their corresponding address else they will not be able set any type communication links. Once addresses are set, they can go on normal transmission of messages between them (Prabakaran, 2014).

#### 3.1.2. Information-Centric approach

Another approach of designing an architecture is based on information. The node who needs information requests that in from network. When the information is found then node will connect and accept information through transmission. Nodes which encounter the information will maintain a copy in its cache. Then in further if any nearest nodes call same information then with a minimum time and in efficiently it will be forwarded to called node. So, it will not create any traffic imbalance (Ahlgren, 2012). Figure 3 depicts node centric and information centric

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