

# Survey Paper for SPIN Protocol in Wireless Sensor Network

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**Abstract----** Sensor protocol for information via negotiation is a data centric protocol which is used in wireless sensor network. SPIN solves the implosion and overlapping problem of sensor nodes and therefore it is one of the best routing Protocol in WSN. SPIN protocol Disseminate the data to its neighbor node only who are interested in receiving the data the nodes who are not interested in receiving the data ignore the data by not sending the request back to the source node. SPIN sends the data from the source node to all the nodes in the network by the process of data Dissemination. SPIN communicate by using three phases of communication. In this survey paper we will focus on all the aspects of SPIN protocol only.

**Keywords---**Wireless Sensor Network, Sensor Protocol for Information via Negotiation, ADV, REQ, DATA, M-SPIN.

## I. INTRODUCTION

Wireless Sensor Network consist of small nodes which are scattered over a huge area of network. these nodes are used for various applications such as Medical Monitoring, Disaster Management, Military Applications, Network Monitoring, Pollution, Home Surveillance etc. sensor nodes are very small. the volume of sensor nodes is in cubic millimeter so they cannot be recharged and replaced. we have to conserve the energy of the sensor nodes as the energy is provided by the battery. Therefore we have to conserve the energy and increase the lifetime of the sensor network.

To solve the energy constraint problem in wireless sensor network we are using SPIN protocol because earlier LEACH protocol was used and LEACH protocol communicate by forming clusters of sensor nodes but it is not as energy efficient as SPIN protocol is.so we are focusing on SPIN protocol in wireless sensor network to conserve the energy of the sensor nodes and increase the bandwidth.

## II. SPIN PROTOCOL

SPIN- sensor protocol for information via negotiation. SPIN protocol is one of the best Protocol in the wireless sensor network. SPIN protocol Communicate by using 3 phases of Communication.

- 1.ADV- whenever the source node has a new data to share it will send an advertisement to all its neighbor nodes in the network.
- 2.REQ- the nodes who are interested in receiving the data will send a request to the source node by saying that I am interested in that data. But if the node is not interested in

receiving that data or the node may have same data already then it will ignore the data and will not send any message to the source node.

3.DATA- upon getting the request the node will send the original data to the nodes and this process will continue till all the nodes in the network get the data.

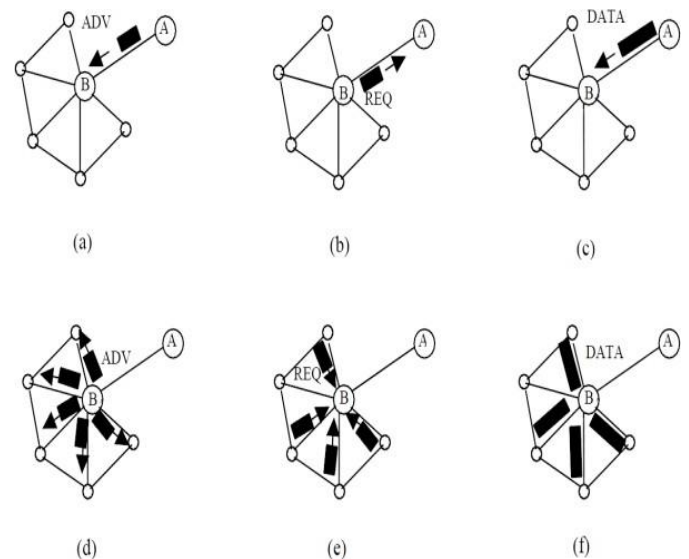


Fig. 1 Working of SPIN<sup>[1]</sup>

## III. M-SPIN

In forest fire system, alarm monitoring system, and disaster management system where we need quick response before the event occurs. therefore M-SPIN is used because it is more reliable and sends the data faster than SPIN in the network.

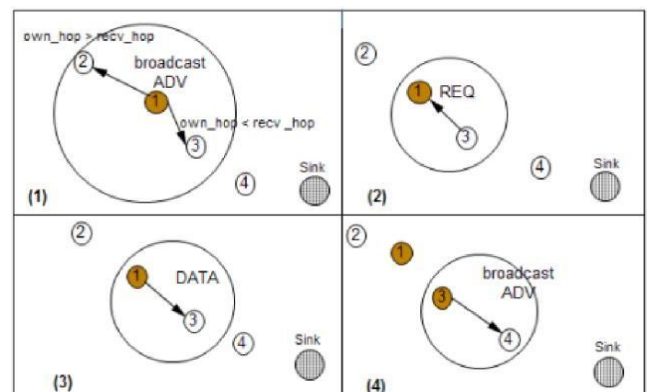


Fig. 2.M-SPIN protocol<sup>[2]</sup>

M-SPIN uses 3 types of messages for communication.

### 1. Distance Discovery

It is used to send the startup packets from the source to the sink in terms of hop distance .M-SPIN uses hop distance to find the distance from the source to the sink of all the nodes.it send the startup packets which consist of node id and hop distance the nodes having maximum hop distance are far away from the source node. Initially it sends the hop node to the other nodes and stores the hop distance and increase by one and then send it to the other nodes. this process continues till it reaches all the nodes in the network.in every node the previous hop value is increased by one and send to the next node in terms of hop distance.

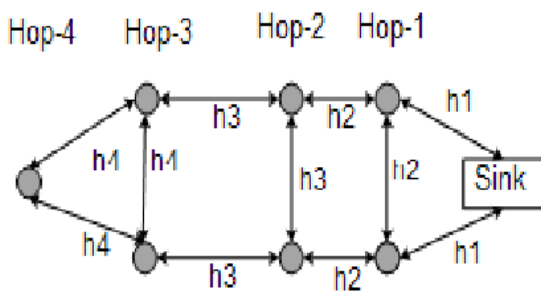


Fig. 3. Distance Discovery Phase [2]

### 2. Negotiation

This process is similar to the negotiation process of SPIN protocol in which we send an ADV to the neighbor node in the network and the neighbor nodes which are interested in receiving the data will send a request to receive the data and when the request is arrived we will send an actual data in the network till the data disseminates in the whole network.

### 3. Data Transmission

Data transmission occurs when we send the data to the network upon receiving the request from the sensor nodes the nodes who are interested only send the request back to the sensor nodes. At last the data is send to the whole network in the WSN.

## IV. S-SPIN

S-SPIN protocol is used for sending the data from individual sensor nodes to all the nodes in the network using the cluster algorithms in the network. each node in the network has its own resource manager which keeps track of all the usage in the network. every time the node Participate in clustering the node update its energy value and if the energy value is less than threshold value then the node will die and it will not take part in clustering any more.

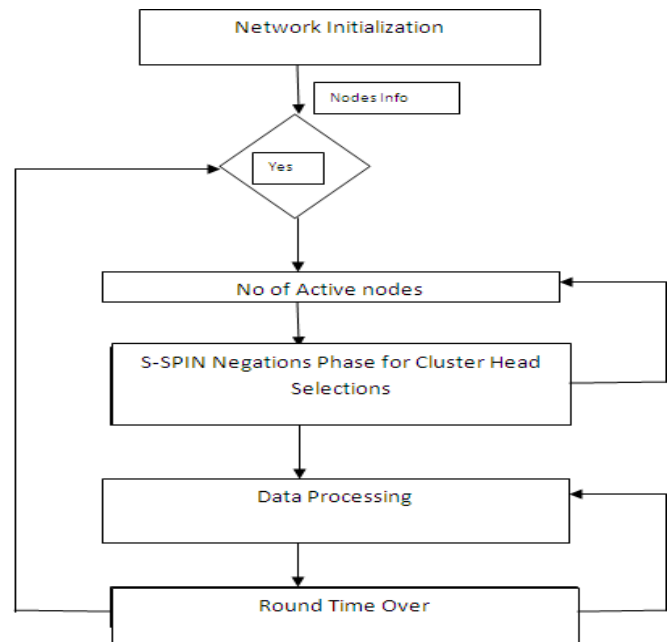


Fig.4. S-SPIN [4]

## V. SPIN-1

SPIN-1 solve the problem of blind forward and data inaccessible. Its working mechanism is same as SPIN but it has some good features than SPIN as mentioned below:

1. The initial energy of each node in SPIN 1 is equal. Nodes A and B can communicate with each other, if link is same.
2. Dissemination between two nodes is far away from the interference of other nodes, in the network and power is without any constraints and nodes remain stable.
3. We Assume that all nodes in the WSN need to receive the data, and are located on the path to reach sink nodes.
4. Wireless signals in every direction consume the same energy. SPIN-1 compares the energy of the source node when it REQ for data to threshold energy if energy is enough to perform whole process it sends 1 otherwise it will not send any respond to the ADV packet. But in SPIN, node sends 0 with REQ on ADV.

## VI. PROBLEM STATEMENT

1.Sensor nodes has a limitation for power supply, as it is provided by the battery and the battery is neither rechargeable nor replaceable.

2.So we need to work in order to decrease the energy usage of the Wireless sensor node and increase the lifetime of the sensor network.

## VII. DISADVANTAGES OF SPIN

- 1.the sending of data towards the sink node from the source node takes very long time.
- 2.if a node has more computation power then it will consume more energy as compared to other node in the network.
- 3.if a node is used many times then it will lose energy early then the other nodes in the network.
- 4.if a node is sitting idle then its energy will be reduced without transmission of data.

## VIII. PROPOSED SOLUTION

- 1.The Initial Phase: - I have read Literature Survey in brief from the papers like IEEE, Springer etc. it has helped me in providing the basic and conceptual knowledge of my domain.
- 2.The Implementation Phase: Matlab Programming tool will be used for the development of algorithms in energy efficient routing in WSN. SPIN protocol is one of the best Protocol in WSN routing. I will implement SPIN protocol in homogeneous WSN.
- 3.The Testing Phase: At last we will conduct a analysis for various network parameters.

## CONCLUSION

Naming data using meta data descriptors in SPIN protocol solves the implosion and overlapping problems it only sends local information to their nearest neighbors only. Modified SPIN (M-SPIN) protocol uses hop-count values of sensor nodes for sending information in WSN. negotiation is also done before sending the actual data. M-SPIN has higher energy savings by rejecting packet transmission to the inverse direction of sink node. SPIN-S protocol is presented using cluster algorithms. This protocol provides the guarantee that the data is send to base station along with more stability and better network life time. Secure SPIN protocol is used to increase the life time of the wireless sensor network and to achieve higher scalability because the dead nodes including cluster heads are all replaced by using recovery and replace algorithm.

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