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# Survey of Energy Efficient Schemes for Wireless Sensor Network

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**Abstract**-Energy conservation is one of the major important issues in wireless sensor networks. In WSN communication is based on battery operated computing and sensing devices. In WSN sensor networks energy to be deployed in an Adhoc manner, with positive approach, individual nodes can be largely inactive at idle periods of time, but when something is detected then becoming suddenly active. In WSN the major challenges for research is conservation of energy. This paper reveals the correlations between node components and energy. Energy model covers energy which is consumed by processor level, CPU level and battery level. Energy conservation and Life time issues in WSN can resolve by improvement in existing model.

## I. INTRODUCTION

A wireless sensor network (WSN) of spatially distributed autonomous sensors to monitor physical or environmental conditions, such as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location. The more modern networks are bi-directional, also enabling control of sensor activity. The development of wireless sensor networks was motivated by military applications such as battlefield surveillance; today such networks are used in many industrial and consumer applications, such as industrial process monitoring and control, machine health monitoring, and so on. Wireless Sensor Network usually contains thousands or millions of sensors, which are randomly and widely deployed [1]. The complexity of WSN designs has challenged researchers since the 70's.

**1.1 WIRELESS SENSOR NETWORK**– WSN Is a wireless network consisting of small nodes with sensing, computation, and wireless communications capabilities. Each sensor collects data from the monitored area (such as temperature, sound, vibration, pressure, motion or pollutants). Then it routs data back to the base station. WSN consist of hundreds or thousands of small, cheap, battery-driven, spread-out nodes bearing a wireless modem to accomplish a monitoring or control task jointly. An important concern is the network lifetime; decreases and the network can finally be partitioned and become dysfunctional.

**1.2 The general wireless sensor network characteristics are –**

- Mobility- The fact that nodes can be rapidly repositioned and/or move is the raison feature of WSN.
- Multi hopping- A multiple hop network is a network where the path from source to destination traverses several other nodes.
- Self-organization- The WSN network must autonomously determine its WSN configuration parameters including: addressing, routing, clustering, identification, power control, etc.
- Scalability- In some applications the Wireless Sensor Networks can grow to several thousand nodes.

## II. LITERATURE SURVEY

[1]In this paper Author presented Performance Analysis of Energy Efficient Routing Protocols in different traffic based Mobile Ad-hoc Networks. Author describe how the network performance can enhance for different routing protocols, when frequent link failure in network due to mobility of the nodes in the

network.[2]In this paper Author presented Improve AODV for WSN.The AODV protocol is based on the minimum number of hops. In order to solve this problem, author divided the nodes into three stages according to the residual energy of them. Then they improved each phase of the protocol in order to ensure the maximize life of each node, so that the survival time of entire network would be improved obviously. [3] In this paper Author described a node energy model that can accurately reveal the energy consumption of sensor nodes is an extremely important part of protocol development, system design and performance evaluation in WSNs. In this work, author also describe study of different component energy consumption in different node states and with in state transitions. Authors presented the energy models of the node core components, including processors, RF modules and sensors. Furthermore, The proposed model can be used to analyze the WSNs energy consumption, to evaluate communication protocols, to deploy nodes and then to construct WSN applications. [4] In this paper Author presented A Multipath Energy Efficient Probability Routing Protocol in Ad Hoc Networks. Author proposed a new protocol. It is a multipath energy-efficient probability routing protocol based on AODV (MEP-AODV). In MEP-AODV, not only battery energy consumption but also multipath selection is considered. [5] In this paper Author presented Energy Efficient Routing in Wireless Sensor Networks through Balanced Clustering. A new protocol called Equalized Cluster Head Election Routing Protocol (ECHERP), which pursues energy conservation through balanced clustering, is proposed.[6] In this paper, Author proposed a novel fully distributed nearly stateless routing protocol for inter cluster routing via intermediate sensor nodes in hierarchal sensor network. This protocol determine energy efficient short path to the destination by dynamically computing energy threshold to prevent energy deficient node from participating in routes.

## III. PROBLEM IDENTIFICATION

Based on Literature survey the key challenges in WSNs are:

- To save the energy at node level/Router Level
- To preserve energy of sensors in transmission and receiving.
- To maximize the lifetime of sensor nodes by preserving.

## IV. PROPOSED SOLUTION

Energy is consumed in WSN during the transmission and receiving of data at router level. Save energy can be used for further communication. The energy computed is involved in the selection of optimal path, which requires minimum energy to route the data from source to destination. Energy Consumption Control model is based on-

Processor Energy Model (PEM)-Energy Consume by processor
Transceiver Energy Model (TEM)- Energy Consume by cpu and path
Sensor Energy Model (SEM) – Energy Consume by sensor

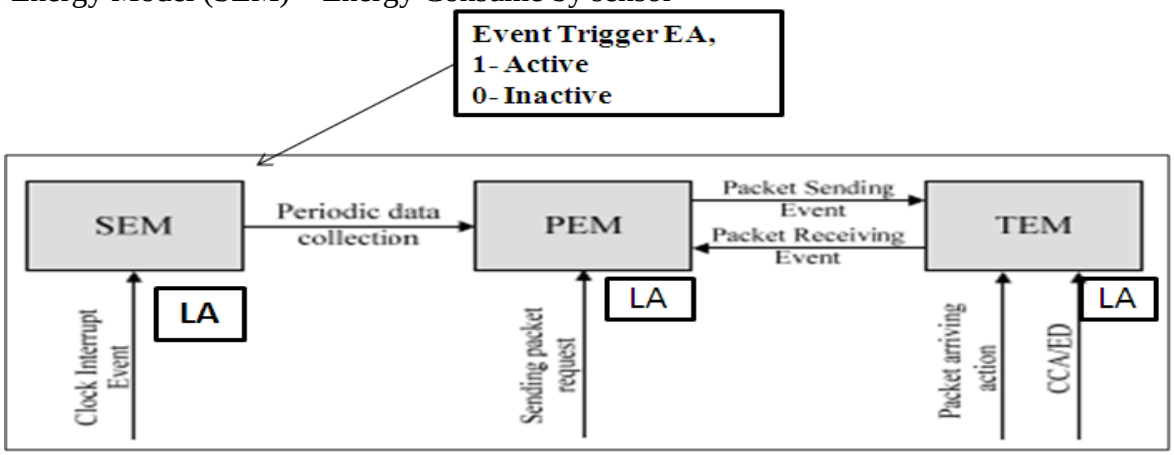

Fig4.1- Event Trigging mechanism based for EESW Model

In this model, the relevant parameters are simplified to obtain the following formula:

$$P_{u,v}=Kd_{u,v}^{\alpha}$$

Where **K** is a Positive Number, α still takes 2 or 4
In [3] the directed graph Gs, Each edge (link) (vi, vi+1), set double weights as follows:

$$\theta(u) = \frac{P(u) - Kd_{u,v}^{\alpha}}{E(u)}$$

Energy Consumption Function For EESW

**P(u)** =denotes u in t period of residual energy
**$Kd_{u,v}^{\alpha}$** =Denotes energy lost in the communication
**E(u)**= Initial Energy given to the node.
Where θ(u) is between 0 and 1 **or** $0 < \theta < 1$.

## 4.1 ALGORITHM FOR PROPOSED ENERGY EFFICIENT SCHEME FOR WSN

**EESW Algorithm for Energy Efficient Routing in WSN**
Input: Initialize the nodes
Output: More life time and less energy consumption
Step1: Initialize the minimum Threshold value minth for the WS Network
Es(P)=min i€p (Ei) //Now Calculate threshold vale Th by following formula
max-min=max(min)(Ei)
minth=α * max-min // Calculate threshold value minth by below formula where $0 < \alpha < 1$
maxth = minth * p , where p >1
Calculate threhold maxth value

Step2: How can select node for communication path
-Firstly Broadcast a request by sender for selection of route in the network ,PREQ
-By PREQ request message, only shortest path will selected from all the available routes.
-For communication between nodes, established a communication path
if (( Energy level for a node )> (available Threshold energy for the network))
Then only "Node is selected for communication"
Set Location Aware variable ,La=1 for active node and La=0 for inactive node
else "From the communication path ,reject all the node which are Unselected "
Step3 – Calculate Energy consumption during communication, by EESW energy model function for processor ,transceiver and Sensor

Step4- Set Event trigger for processor, sensor and transceiver
if (path is selected) { Activate Event trigger for communication node
Set S_E_trigger= 1, P_E_trigger=1,T_E_trigger=1 }
else
Set Ictivate Event trigger for non communication node
Set S_E_trigger= 0, P_E_trigger=0 ,T_E_trigger=0 ,Where 1= Active and 0 = Inactive
Step5: For all the remaining node, Form all the available path ,recomputed route/path for communication
For all the available nodes in the network
do: (trigger not found)

if (( NODE Energy level ) <= (Network Threshold energy or node is out of the network range ))
-"low node energy warning is generated and forwarded it to the source and source will starts finding of new path/routes to the destination side.
if (Newly selected path contain minimum number of hops ,then only route is selected)
"When route selection done, energy consumption will at each node for sender and receiver"
else
" For again selection of new communication path between communication node, either select previous path or go to step No 2 and perform all the steps continuously"
- In route recompilation Select only those route which is based on minimum no of
end

## V. CONCLUSION

Proposed EESW scheme will simulate on NS2 simulator and compare with existing Energy Model. After the simulation results will clearly show that, proposed model EESW performs better than the Existing Energy Model. EESW will improve following parameters for WSN, like Network life time, Packet Delivery and End to End Delay as Compared to Existing Energy Model. EEWS will show less energy consumption over existing model and can be applied to large network to increase the Stability.

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