Analysis of Traditional BEEM based Protocol in Wireless Sensing Environment

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***Abstract* – Wireless communication becomes one of the fastest growing fields in today's technological world. It will be increase day by day and its growth in technology. Any type of protocol can be used in this network to get desired range and output. In this research article, WSN performance is measured by BEEM AND MBEEM over a different environment such as running or dead nodes, packets sent to cluter or Base Station. The main objective of this article is evaluate the operation of BEEM in heterogeneous mode and to provide data transmission at high speed and lesser requirements.**

Index Terms– Wireless sensor node, Dead node, cluster, Base station, protocol, BEEM, MBEEM.

I. INTRODUCTION

1.1 Wireless Sensor Networks

Sensor networks are dense wireless networks of small, low-cost sensors, which collect and disseminate environmental data. Wireless sensor networks facilitate monitoring and controlling of physical environments from remote locations with better accuracy[1]. They have applications in a variety of fields such as environmental monitoring, military purposes and gathering sensing information in hospitable locations. Sensor nodes have various energy and computational constraints because of their inexpensive nature and adhoc method of deployment. Previously, sensor networks consisted of small number of sensor nodes that were wired to a central processing station. However, nowadays, the focus is more on wireless, distributed, sensing nodes. But, why distributed, wireless sensing? [2] When the exact location of a particular phenomenon is unknown, distributed sensing allows for closer placement to the phenomenon than a single sensor would permit. Even there algorithmic issues in sensor deployment and coverage, routing, and fusion[3]. A wireless sensor network consists of a large amount of sensor nodes which can be densely deployed either inside the environmental surroundings or near it. This permits random deployment in inaccessible hazardous environments. One of the limitations of wireless sensor nodes is their inherent limited energy resource. Besides maximizing the lifetime of the sensor nodes, it is preferable to distribute the energy dissipated throughout the wireless sensor network in order to minimize maintenance and maximize overall system performance [4,5,6].

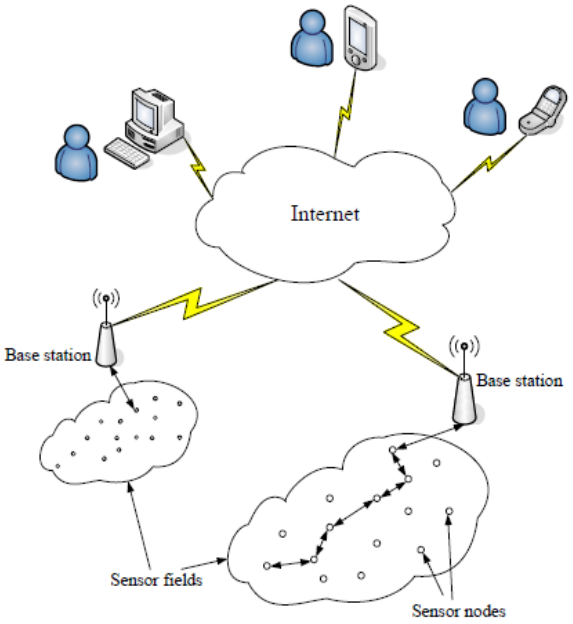

Figure 1: WSN through Internet

Seema Bandyopadhyaye [7] proposed a distributed, randomized clustering algorithm to organize the sensors in a wireless sensor network into clusters.Wei Ye[8] proposed S-MAC, a medium-access control (MAC) protocol designed for wireless sensor networks. Where results shown that, on a source node, an 802.11-like MAC consumes 2–6 times more energy than S-MAC for traffic load with messages sent every 1–10s.Sensor nodes tend to coordinate among themselves to produce much qualitative

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information about the physical environment. Every sensor node makes its decisions on its mission, the information it currently posses, and its knowledge of its computation, communication, and about energy resources. Every one of these scattered sensor nodes has the capability to collect and route data either to other sensors or back to an external base station. B. Munish [9] have analyzed that group of cluster heads saves energy consumption in the network. As the number of cluster heads increases the number of sleepy nodes also increases. The BS possess very large storage and large data processing capabilities. Q. Wang [10] have proposed a novel clustering-CH-exchange-method which includes the concept of MIMO in WSN.M.Kiranmayi[11] explored the significant advantages, disadvantages of design issues of different routing protocols. This article also discussed for security in UWSNs, underlying the specific characteristics of these networks, possible underwater attacks, their countermeasures and challenges.

1.2 Heterogeneous Wireless Sensor Network

Heterogeneous sensor network,consists of two or more different types of nodes with different battery energy and functionality are used. The motivation being that the more complex hardware and the extra battery energy can be embedded in few cluster head nodes, thereby reducing the hardware cost of the rest of the network. Jae-Hwan [12,13] described a heterogeneous routing protocol according to network structure, location and protocol operation. All protocol have their own specialties to perform on certain operations.

1.3 BEEM Based Protocol

It is the algorithm based on HEED. BEEM[14] exceeds HEED and LEACH from two perspectives that is longevity and balanced sensor distribution. It can guarantee the network coverage for a longer time, compared with HEED and LEACH. In BEEM nodes can communicate symmetrically. All the nodes are deployed randomly and placed at fixed location. Lina Xu [15] introduced Balanced Energy Efficiency(BEE) clustering algorithm and its multi hop version (BEEM)

II. PROPOSED ALGORITHM

Following are the basic steps which are taken into consideration to complete the assigned task.

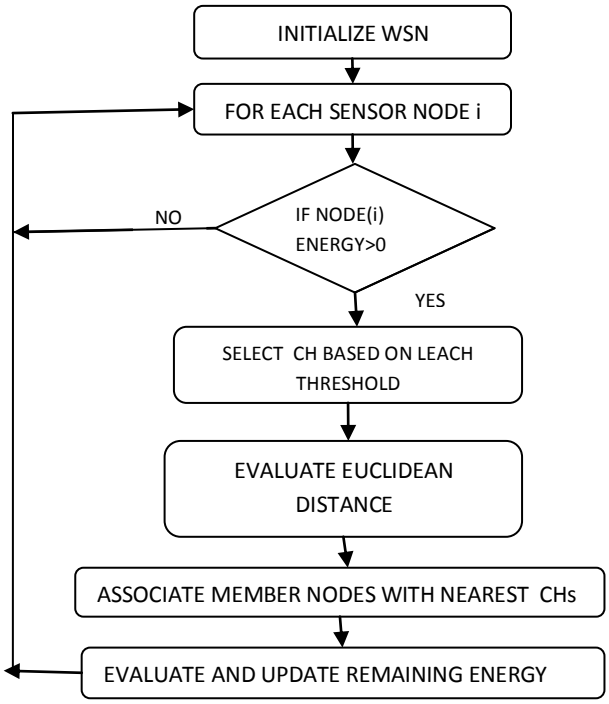

Figure 2 : Proposed Method

III. SIMULATING RESULTS AND DISSCUSSION

In this article, simulation results are obtained with the help of MATLAB software. All following figures are representing the possible operation of BEEM and MBEEM.

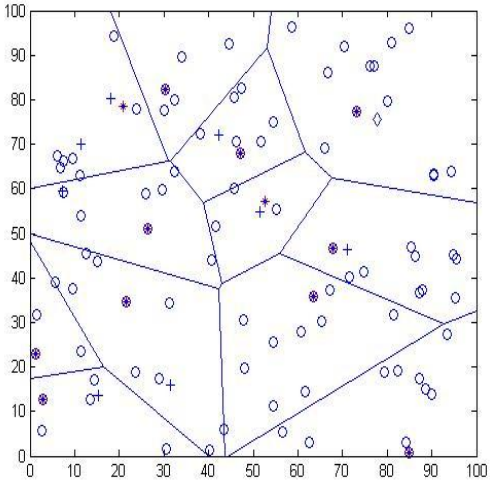

Figure 3:All running Dead Nodes

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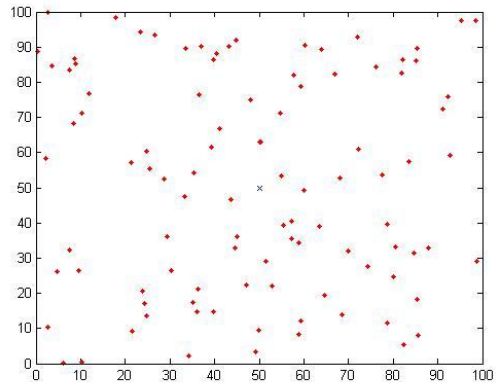

Figure 4: All Dead Nodes

The figure 3 is showing all the running dead nodes.100x100 sensor area is taken in figure 3 and figure 4 is showing the all dead nodes.

Where Red diamonds = The dead nodes.
Circles = Normal node
Blue circles = The cluster head
Plus = The advance node
Diamond = Base station
Blue advance node = the cluster head

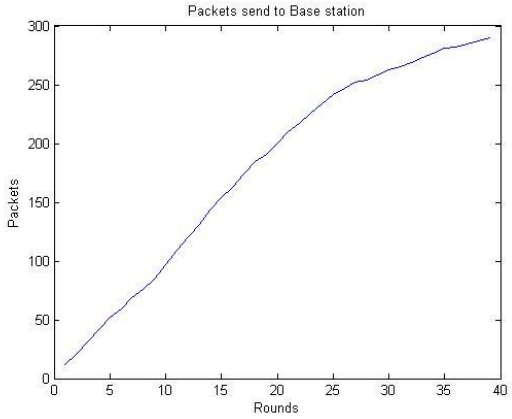

Figure 5: Packets send to Base Station(BEEM)

In figure 5, 290 packets are sent to base station until 38 rounds. Therefore more packets are sent ,hence results are better than existing method..

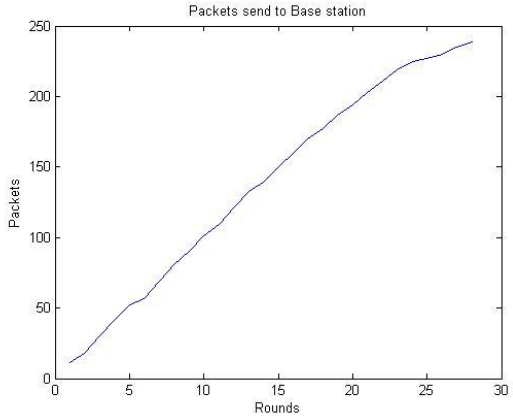

Figure 6: Packets send to Base Station(MBEEM)

In figure 6,240 packets are sent to base station until 26 rounds.

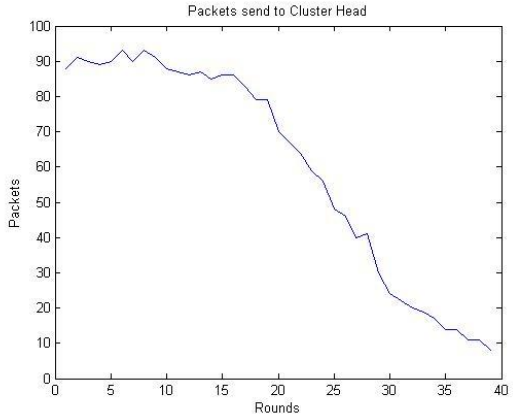

Figure 7: Packets send to Cluster Head(BEEM)

The figure 7 shows that 95 packets are sent to cluster head until 38 rounds.The 15 rounds are full and after that packets are deploying at high speed.

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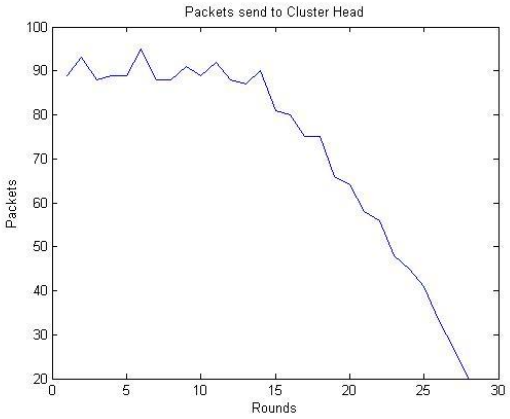

Figure 8: Packets send to Cluster Head(MBEEM)

The figure 8 shows that 90 packets are sent to cluster head until 28 rounds.The 10 rounds are full and after that packets are deploying at high speed.

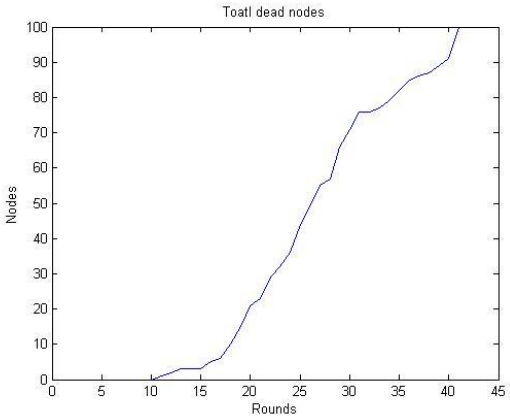

Figure 9: Total Dead Nodes(BEEM)

The first dead node is happened at 10 round and last dead node is happened at 42 round.

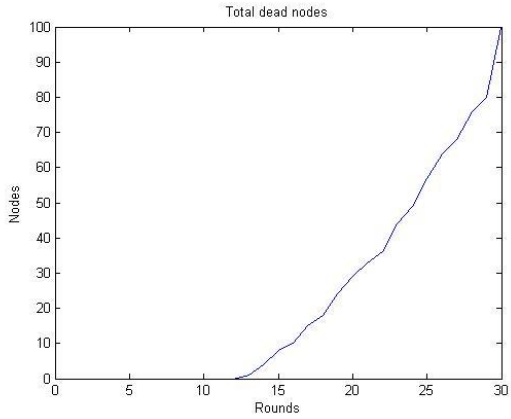

Figure 10: Total Dead Nodes(MBEEM)

In figure 10,the first dead node is happened at 12 round and last dead node is happened at 30 round.

IV. CONCLUSION AND FUTURE SCOPE

At this paper, the main challenge is to evaluate the performance of Balanced energy efficient protocols for heterogeneous wireless sensor networks be observed. Secondly, it is also evident that BEEM performs very well than traditional MBEEM protocol in all aspects. Near to future, different technique can be used to overcome the disadvantage of MBEEM and more enhanced outcome can be found. Even in future, the integration of MBEEM with Token bucket algorithm may show advanced results.

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