Energy Efficient-DSR Protocol Using Multi-Hop Routing based Cluster Formation in Manet

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Abstract--- Wireless Sensor Networks (WSNs) are usually employed for the fields like military application, environmental application, and queue tracking and so on. WSNs are widely essential for the protection of securing network. In this paper, Energy Efficient dynamic source routing (DSR) routing protocol is employed for reducing delay performance in wireless environment. The competent routing protocol is the one that might carry the information in a short time devoid of overwhelming a lot of bandwidths. The protocol EE-DSR utilizes routing of source and maintaining useful paths. It comprises of route servicing and route detection. The modified multi-hop routing protocol (MMR) exploits rigid clusters to provide communication among base station and sensor node. Then the optimal route selection is made. The performance analysis is carried out by comparing the outcomes with existing mechanisms.

Keywords--- Energy Efficient-DSR Protocol, Cluster Formation in MANET.

I. Introduction

Mobile ADHOC network is a self-setting infrastructure less network with dynamic topology. Nodes in the network use radio waves for its communication. Sink nodes within its radio range forms direct link while others use intermediate communication. In spite of its distributed nature MANET is independent of access points and base stations. Nodes in this kind of network are battery constraint which influence in higher level in its performance. Due to dynamic topology nodes are often associate and dissociate from the group despite of absence of network administrator. A network with battery dependent dynamic, distributed multi hop atmosphere the nodes are suppose to be responsible themselves to properly work out the mandatory network from functionality. Other than these conventional issues like less reliability than wired media, the physical security to be limited, the channels are time varying, interference are also applicable to MANETs [1].

[2, 3]. Thus, the multi-hop scenario occurs, the number of intermediate hosts and its corresponding packets to be sent through the host of source and to make the destination node arrived [4, 5]. The one of the most interesting issue in MANET regarding the routing protocols is that the nodes whether in the network or not. The track of routes keep to permits all the possible paths and the exact destinations to be arrived, or instead of keeping the tracks for only immediate access of those destinations. MANET is one that together comes as desirable, not essentially with any sustain from the presented communications or any other fixed stations kind [6-8].

MANET based a node that does not required for routing formation with any another node until the node is necessarily participate in the communication [3, 9]. For all types of scenarios, controversial issues never fixed with route mechanism. However, any of the methods to be used that depends upon the situation of route usage and application enabled challenges [10]. The method keeps the information about the all near routes in the network. The time consideration and the available methods defined the various routing protocols have been proposed.

The rest of the paper presented as followed as: section II provides the brief explanation of existing methods that employed in the security management of MANET in WSN. Section III is the approaches of overall workflow of the proposed scheme. The performance evaluation was done in section IV. At last, section V concludes the entire workflow.

II. Related Works

MANET based a node that does not required for routing formation with any another node until the node is necessarily participate in the communication [3, 9]. For all types of scenarios, a controversial issues never fixed with

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route mechanism. However, any of the methods to be used that depends upon the situation of route usage and application enabled challenges [10]. The proposed method that enable to keeps the information about the all near routes in the network. The time consideration and the available methods defined the various routing protocols [10]. [11] proposed the number of packet forwarded parameters defines the trust scheme that provides the observed from the neighbours and the evaluation of trust recommendation with the inclusion of the energy spent by a node. [12] proposed the bait detection scheme evolves the heuristic approach, referred to as sequence number. The malevolent nodes that attempts to isolate during the process of route discovery. The Adhoc on-demand distance based vector routing protocol incorporated with its mechanism. [13] enhanced the predicting node trend AODV strategy by integrating node identification and using the real time location information. This anticipated approach have been implemented and tested on NS-2.35 platform. Different system quality parameters were evaluated similar to delay, throughput, packet delivery ratio, control overhead for legitimate correlation. [13] enhanced the predicting node trend AODV strategy by integrating node identification and using the real time location information. This anticipated approach have been implemented and tested on NS-2.35 platform. Different system quality parameters were evaluated similar to delay, throughput, packet delivery ratio, control overhead for legitimate correlation. [14] projected a strategy of optimal link that is self-sufficient of arrival time of message and be capable of executing in a dispersed manner. After that, the expected path delay is derived by considering delay components dependence alongside the path, and proposes the strategy of optimal routing for the minimization of estimated path delay. The simulations on Trace-driven has been employed for the validation of thorough analysis, and demonstrate the better proposed strategies performance that outcome in a considerable reduction of delay and greatly a high delivery ratio on comparing with existing solutions devoid of drop boxes. DSR is a dynamic routing protocol. It is made for multi-hop WANET fundamentally. It is a configuring and self-organizing protocol which does not need any management. The two major assumed protocol functions are route maintenance and discovery. The supposed functions work among each other for route maintenance and node discovery [15].

III. Proposed System

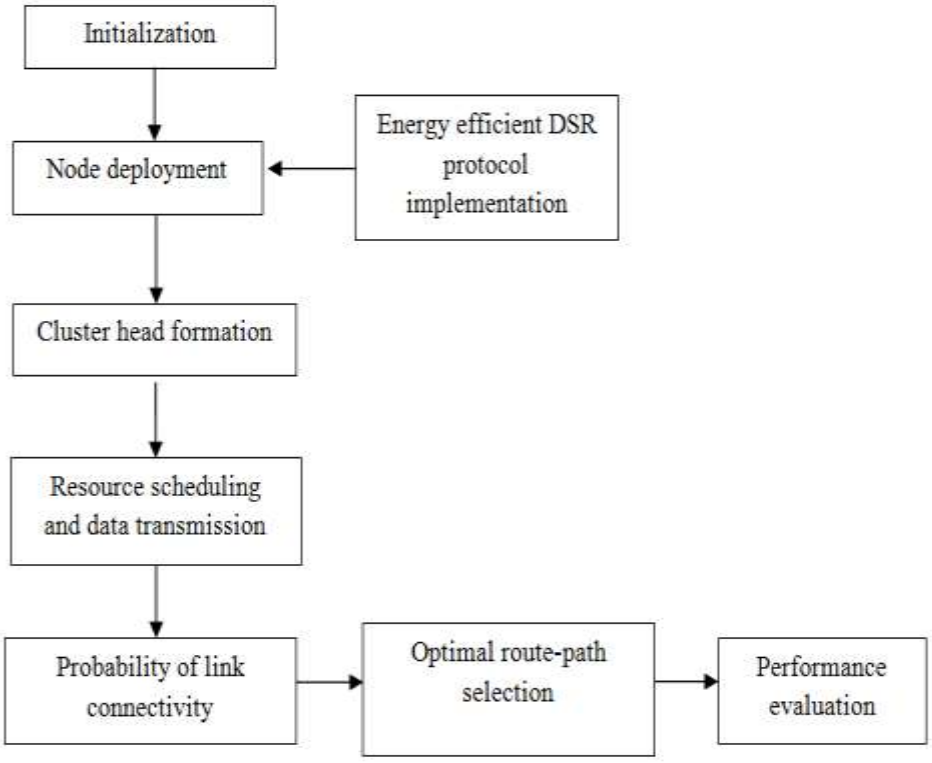

Figure 1: Flow of the Proposed Scheme

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The flow of the proposed mechanism is shown below: The cluster of the nodes formed in MANET enables without the use of the network as well as the cluster heads forms a short-term networks. The behavioral conditions of the nodes freely communicate with any node and also easily enters through the use of intruders.

A. System Model

The implementation of Energy efficient DSR protocol the node deployment and routing table updation takes place. Then the formation of cluster is made by the use of multi-hop and relay based clustering technique. The routing protocol is created based on the energy. In this, the identification of node energy, n number of nodes, neighbor nodes, source and destination node is assigned in this node deployment process. Then the calculation of energy is estimated in further steps by the implementation of routing protocol.

B. Energy Efficient DSR Protocol Implementation

The energy efficient DSR routing protocol is implemented to estimate the energy efficiency of protocol which then selects or chooses the path for transmission. The protocol EE-DSR utilizes routing of source and maintaining useful paths. It comprises of route servicing and route detection. The table of route request is being partitioned through the target home address of route detection. The Table of Route Request is considered for the collection of records regarding Route Request packets that were originated or forwarded recently through this node. In the network VANET each node is being serviced on its own tables that save the cache route. Route Cache is accountable for keeping all information requested that relates to routing by means of new contributor node in a network by a routing protocol EE-DSR.

C. Cluster Head Formation

The modified multi-hop routing protocol (MMR) exploits rigid clusters to provide communication among base station and sensor node. In MMR, while a sensor node is connected to the cluster, then it would be the member for that particular cluster throughout the network lifetime. The reason for utilizing rigid cluster is towards the reduction of overhead energy consumption required at every transmission round to create a new clusters which is considered as a general method for a large amount of WSN routing protocols.

D. Optimal Route Selection

The entire nodes and its deployment accessed inside the network. The neighbor nodes distinguished the every node that sends the message when neigh_DIS. Consequently, once getting message neigh_DIS, the neighbor node receives the acknowledgement (ACK) and sends a reply message to the corresponding nodes.

The identification number of a node defines the sequence number, hop count numbers, distance among the nodes, and ID of the node when all the acknowledgement message received. Acknowledgement message gets from the neighbour node that depends upon the time consideration such as t_{wait}. The entire nodes in the network established the equivalent time period to attain the respective ACK message. Neighbor Routing Table (NRT) can built by a mobile node when ACK message employed the entire communication over the all nodes in the network.

This time period is equivalent to the entire the nodes in the network. In the course of ACK message, a mobile node can build the and this information could be employed throughout communication among the nodes. The format of NRT values represents in Table 1.

Table 1: Neighbor Routing (NR)

Node id (N_{ID})	Sequence Number (SEQ_{No})	Number of Hop (N_{Hop})	Transmission Power (P_{Tx})	Link Duration (L_{Dur})	Interference No ($N_{Interfer}$)	Path Availability (Pa_{avail})
1.	3	7	100	20	3	5

IV. Performance Analysis

The results and performance analysis of the proposed method to be discussed in this section.

Throughput

It is the successful transmission ratio with regard to time. It is deliberated as bits per second (bps).

$$\text{Throughput} = \frac{Successful\ data\ transmission\ (bits)}{total\ time\ taken\ (seconds)} \quad (1)$$

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The comparative analysis of throughput estimation is provided in the graph. The performance is estimated for proposed mechanism with respect to existing techniques.

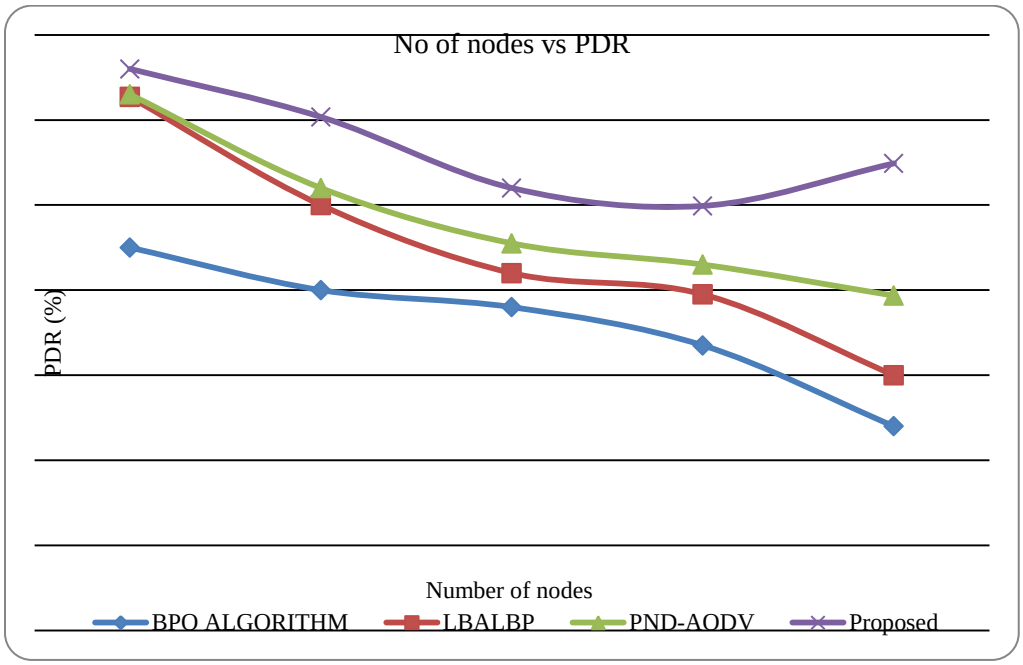

Figure 2: Performance Analysis of PDR

Figure 2 represents the performance analysis of PDR.

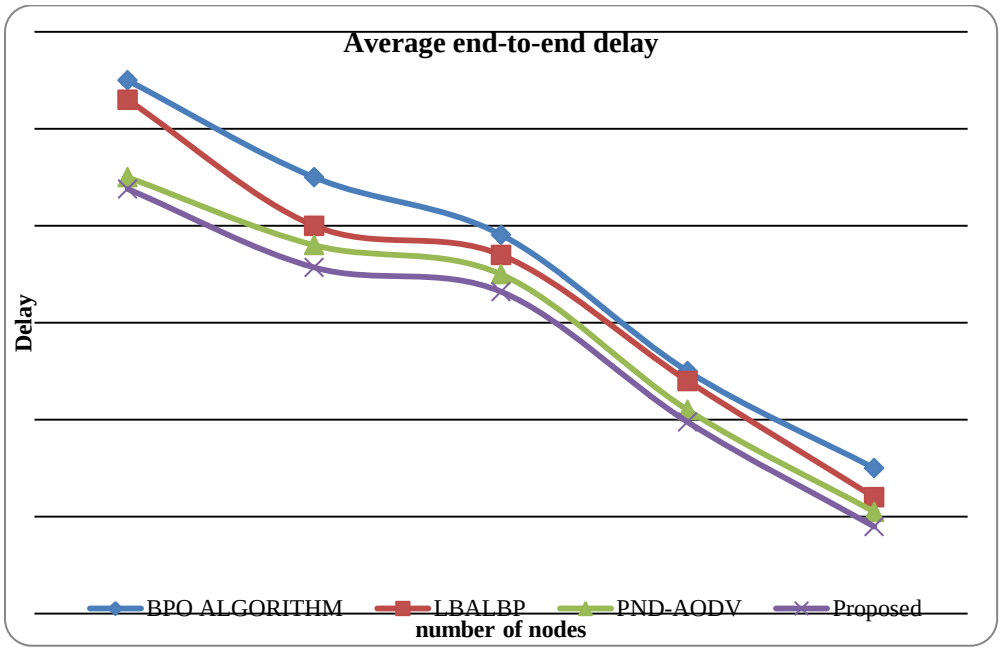

Figure 3: Performance Analysis of Delay

Figure 3 illustrates the performance analysis of delay.

Figure 4 illustrates the performance analysis of throughput. The performance results represents the proposed methodology such as PDR, delay , and throughput by compared to other existing protocol methods. To compute the shortest path and its respective links among the nodes provide the routing protocol process and also achieved the ratio of high throughput function.

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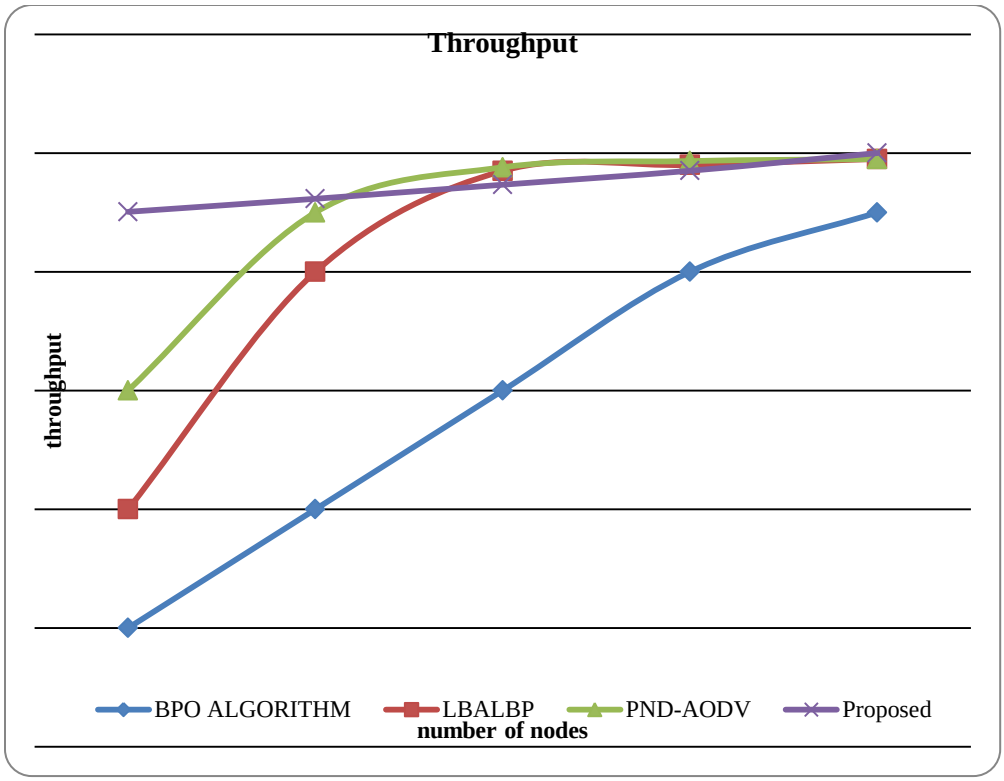

Figure 4: Performance Analysis of Throughput

V. Conclusion

An Energy efficient DSR protocol is implemented in which the node deployment and routing table updation takes place. Afterwards, multi-hop and relay based clustering technique is utilized for the formation of cluster head. Hence, energy efficiency of the system is improved. Finally, the performance evaluation was estimated and the outcomes are compared with existing approaches in terms of time delay, throughput, and energy efficiency. The attained outcomes reveal that the proposed mechanism was effective on comparing other existing schemes.

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