

AN EFFICIENT CLUSTER BASED ROUTING PROTOCOL FOR MANET

Zaiba Mulla¹, Devraj Gurav², Mani Bushan D'souza³ and Manjaiah DH⁴

Abstract- A Mobile Ad-hoc Network (MANET) is dynamic and self-configuring network that framed by collecting number of mobile nodes. Group of node make one cluster. It is important to have a good and effective cluster formation and cluster head selection algorithm with other neighboring nodes. Their communications ought to do in less time. The different networks are accessible to make cluster. Battery life, speed, packet delivery ratio, delay these are some essential parameter through which we can make proficient algorithm. This survey paper concentrates on the Comparison between Lowest ID (LID), Highest Degree (HD), LEACH(Low Energy Adaptive Clustering Hierarchy).

I. INTRODUCTION

A Mobile ad-hoc network formed by a group of nodes without help of the integrated organization or fixed infrastructure¹. The networks in this way shape by mobile and the devices in the networks, ready to distinguish the nearness of different mobiles and play out the essential set-up to communicate up to facilitate communications⁶.

Every hub has its remote transmitter and receiver called as trans-receiver which permits it to communicate with different hubs in its radio communicating range. Communication via bidirectional wireless links². With a specific end goal to forward a parcel starting with one hub of group then onto the next hub of another bunch, ought to be in one radio extend. At that point they can convey. In the event that they are not ready to convey implies they are out of scope territory of each other. For communication network topology and routing algorithms required to expand the productivity and system life time. The network topology much of the time changes because of the versatility.

The comprehensive survey focuses on the cluster and cluster Head selection algorithm in MANET. The main

objective of the survey is to choose a specific node as a cluster head. It will perform the role of the local coordinator and transmitter in both intra cluster and inter cluster arrangements. Hierarchical routing is possible in clustering in which paths are recorded between clusters instead of between nodes. The LID algorithm works for lowest ID of the node, HD algorithm select Cluster Head on the basis of Highest Degree. LEACH performs re-clustering and selforganizing functions for every round. The paper describes the parameter through which efficiency and life time of network can increased.

II. RELATED WORK

Various algorithms are available to develop and create Cluster as well as selection of Cluster Head.

-Lowest ID

-Highest Degree Clustering Algorithm

¹ Department of Computer Application Aloysius Institute of Management and Information Technology BeeriKotekar, Mangalore, Karnataka, India.

² Department of Computer Application Aloysius Institute of Management and Information Technology BeeriKotekar, Mangalore, Karnataka, India.

³ Department of Computer Application Aloysius Institute of Management and Information Technology BeeriKotekar, Mangalore, Karnataka, India.

⁴ Mangalore University, Mangalore, Karnataka, India

- LEACH (Low Energy Adaptive Clustering Hierarchy)

A] Lowest ID (LID)

This algorithm searches for lowermost and eldest ID from current cluster. The node having lowest ID has chosen as a Cluster Head (CH). It is identifier based clustering algorithm. It will first assign unique id to assigned node or the nodes which are in one cluster.

The research proposed by Hao Wu, et.al.³ Proposed "Type-based clustering algorithm (TCA)" which beats both Lowest ID and Weighted Clustering Algorithm. They give unique ID to every node. They expected that hub ought to know with their own location coordinates and assigned unique IP address in the network. With that unique ID and IP address it will communicate the data to other node in that cluster. For determination of least ID, it will make cluster, and in that cluster search down most reduced hub having most minimal ID. That node will be announced as a Cluster Head for that specific system. In the event that node has a place with various cluster then it will served as a gateway between that two groups. The single Cluster Head (CH) needs to work for long time as no other Cluster Head selected further. The nodes tend to move in a deliberate activity as a group. They employing the stability factor S as the parameter to active the Cluster head selection process.

B] Highest Degree Clustering Algorithm (HD)

Highest Degree clustering algorithm is connectivity based clustering algorithm. The level of a node is registered in view of its distance from others. This algorithm takes that hub which is having most highest degree. The degree of node is computed on the premise of number of nodes associated or connected with that node. As more number of neighborhood nodes is associated with the group node, the degree of cluster head increments. The most elevated degree node turns into the Cluster Head of that Cluster.

In MohiniKumrawat, et.al.⁵The nodes which are in transmission scope of specific node they are accepting ID from one of the node. ID sending node is connected with most astounding number of node and taking an interest in trading the data with all cluster nodes. The node with most elevated number of neighbors turned into the Cluster Head and different neighbors are only an individual from Cluster Head and didn't really partake in decision prepare. On the off chance that it progressively connected with most noteworthy number of different nodes then that node will be considered as a Cluster head shape that Cluster Head. Nodes from group are 2-jump away and cluster heads are specifically associated with each other. In this, they required less number of clusters. This algorithm decreases the quantity of clusters by gathering versatility design, which is gathering of nodes moving with comparative speed and direction. This idea likewise gives stability to network. But disadvantage of this technique is it having very less throughput..

C] Low Energy Adaptive Clustering Hierarchy (LEACH)

In LEACH at a time two nodes active and communicate with each other. CH will be chosen by performing rounds. In each round having two phases one is set-up stage and other is steady stage. Time varieties are relying on frame. It is self-organized and self-adaptive protocol so Random selection of cluster head had done in LEACH. It is thick network of sensor nodes assembled into clusters. To diminish energy dissipation, protocol should be robust to node failure, scalable in order to increase system lifetime and fault tolerant. The energy load connected with being a cluster head is equally dispersed among the nodes. Since the cluster-head node knows all the cluster members, it can make a TDMA plan that advises every node precisely when to transmit its information But the inconvenience of LEACH algorithm is that, it doesn't give clear data about position of sensor nodes and the number of

cluster heads in the network. Every Cluster-Head specifically communicates with BS regardless of the separation amongst CH and BS. It will consume lot of its energy if the distance is far.

III.EXPERIMENT AND RESULT

Following table shows shortly the working, advantages & disadvantages of cluster formation & CH head selection algorithms:

Algorithm	Lowest ID Clustering Algorithm	Highest Degree Clustering Algorithm	LEACH
Working	Least ID node chose as CH	The node which is connected by most highest number of node, chose as a CH	CH will be chosen by performing rounds. Random selection of CH.
Advantages	<ul style="list-style-type: none"> • Easy to know. • Chosen on the basis of unique ID 	<ul style="list-style-type: none"> • CH chosen on the basis of degree. • Rate of data transmission is easy and fast 	<ul style="list-style-type: none"> • CH chosen on the basis of degree. • Rate of data
Disadvantages	<ul style="list-style-type: none"> • Single CH has to work for long time. • Disposed toto power drainage. • Speed of CH to transfer data falls. • Bottleneck problem 	<ul style="list-style-type: none"> • No re-election of Cluster Head. • Load of network rises due to single CH. • Leads to increase overhead. • Low chance of changing Cluster Head. • Number of nodes increases, throughput decreases. 	<ul style="list-style-type: none"> • Time Consuming • More energy required for round implementation

IV.CONCLUSION

The Lowest ID, Highest Degree and LEACH are all Cluster formation and Cluster head selection algorithm. Be that as it may, every one has its own points of advantages and disadvantages. Most Least ID is arranged to power drainage because of serving as Cluster Head for long time.And selection based on only lowest ID. No other criteria for selection of Cluster Head. Highest Degree Cluster head select on the basis of more number of node connected to node. In any case, when node increases in the network, load of that node also increases. It will increases network overheads. In LEACH,Head selection criteria rely on upon the no of rounds and at once just two nods will be dynamic others are rest. But this is time consuming because it will take long time to broadcast data as only two nodes alive so the packet delivery ratio to the destination node will be low. So from this survey we have to develop such system which will increase life time, packet delivery ratio decreases overheads, delay rate.

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