Study of Various Techniques for Data Gathering in WSN

Adityasingh Mandloi, Vineeta Choudhary

Department of Electronics and Communication Engineering, Ujjain Engineering College Ujjain M.P. (INDIA)

Abstract- Data gathering is a basic function in wireless sensor network (WSNs). In this paper we have studied the various techniques for data gathering in WSN namely energy efficient routing algorithm, balance neighborhood aware clustering technique, and mobility aware reputation node taking (MARNR) in wireless sensor network. Energy efficient routing algorithm need to be carefully designed before wireless sensor networks that are widely deployed in the energy efficient clustering routing algorithm (ECRA) which divides the nodes in WSNs in to clusters, then after a chain is formed in each by an improved nearest neighborhood aware clustering technique. A mean neighbor clustering algorithm that event distributes the nodes around the cluster and form well balanced cluster in the system. Mean neighbor clustering protocol uses the local information sensor. In the MARNR technique identifies the sensor nodes mobility rate each node serving the region as cluster is identified from the each. This technique ensures the node should have minimal mobility threshold and high cluster head rank probability.

Keywords :- Cluster head, Node Reputation, hot spot density rate, balanced clustering, cluster range, WSN, mean neighbor clustering.

1 Introduction :-

Sensor nodes are the integral part of wireless sensor networks. Sensor node Communicate via radio transmission. Clustering group the sensor node based on certain parameters and nodes belonging to the same cluster are inter- connected for maintain the communication between the member nodes of the cluster formed. In the most of the existing clustering formation of the efficient clusters depend on the various factors such as degree of connectivity, minimum neighbor, maximum neighbor, topology. In the mean neighbor clustering protocol which aim to evenly distribute all the sensor nodes to form well balanced clusters in high dense networks. In the hierarchical clustering is must used one to conserve sensor energy levels[1]. This cluster head (CH) act as local controllers of the network operations. Cluster Head in WNS is backbone and provide scalable solution to various network. The wireless sensor network is built of nodes from a few to even thousand. Where each node is connected to one sensors the cost of sensor node is similar variable, ranging from a few to hundreds of dollars, depending on the complexity of the individual sensor node. The topology of the WSNs can vary from a simple star network to an advanced multi-hop wireless network. The propagation technique between the hops of the network can be routing. clustering is the task of assigning a set of object onto groups called clusters so that object in the same clusters are more similar to each other than to those in other clusters. Clustering is main task of explorative data mining, in many field, including machine, learning, image analysis, information retrieval and bioinformatics. Hot-spot is around sink nodes where large amount of data decrease as load on relay nodes gets intensified. Hop distance to data sink is proportional to amount of data to be relay. At once cluster head (CH) is

elected then after each CH transmits CH-announcement packet with in an area of transmission radios that informs other sensor its availability as CH. CH-announcement range is a multiple of transmission radios, which ensures that each non-CH nodes revives at least one announcement packet associate to a CH. Energy efficient multi-hop WNS data collection protocol is to calculate its energy consumption amounts that targets low signal overhead[2].

2.Various technique for wireless sensor network:-

various technique for wireless sensor network namely the energy efficient routing algorithm, balanced neighborhood aware clustering, mobility away reputation node ranking for wireless sensor network, Each of the technique are discussed one by on.

2.1 Energy- efficient routing algorithm for wireless sensor networks:-

Data gathering is a typical application in wireless sensor network. Energy efficient routing algorithm are better in term of data gathering. Some assumption for energy efficient routing algorithm[2].

(A) Network Model:-
WNS is modeled as an undirected graph G (V, E, W) were $V=(V_1, V_2, ... V_n)$ is the set of all the nodes in the network. E is the set of all bidirectional wireless links (I,J). The dij is the distance between nodes. V_i and d_J and W is the weight set of all directed links (I, J).

(B) Energy - efficient cluster routing algorithm follows as:-
ECRA works in three phases: cluster formation, tree formation and data transmission. In the first phase, the nodes located in sensed area. in the second phase, a tree routing architecture in each cluster is built. in

the third phase the CH collects data and forwards them to sink along multiple paths[2].

In the cluster formation phase nodes having information for the sink initialize the routing task by transmitting a hello message to neighbor nodes. E_i is the residual energy of node i.

message type	ID	E_i

Figure 1 the format of message.

The density of nodes in wireless sensor network is high therefore the sensed data has high correlation. to reduce

In this technique, initially all the node will broadcast HELLO message with its maximum transmission power (Pmax) to all its neighboring nodes. The information of the total

number of neighboring node is then sent to the base station[5]. The base station then sent the node according to their position in the network depending on the number of neighboring node. One the sorting is done, we select the mean node as the first cluster head candidate, all the other nodes that come with in the transmission range, then we move on to the remaining nodes to the right of the mean position and form similar clusters and then to the left of the mean position.

redundancy of sensed data Therefore the node can be grouped in to cluster.

2.2 Balanced neighborhood aware clustering technique the wireless network:-

In this technique we have considered the wireless sensor network to be an wireless sensor graph G with N number of homogenous nodes randomly distributed through the network. The nodes may be static or mobile. If node to be mobile, the nodes may disappear from the network or change their relative positions hence neighborhood of a node change over the time. For simplicity, in this technique we use node are static or changing very slow.

> **Various criteria for balance neighborhood aware clustering technique**.

1,, Cluster number is the total number of clusters in the network.

2,, Average cluster is the average number of member node in the clusters formed.

3,, cluster range is the difference between the maximum and minimum sized clustered formed.

4,, circularity is considered as total cluster size-multi hop member size of cluster.

5,, Hop distance is the distance of the secluded nodes from the nearest available cluster in order to joint the cluster.
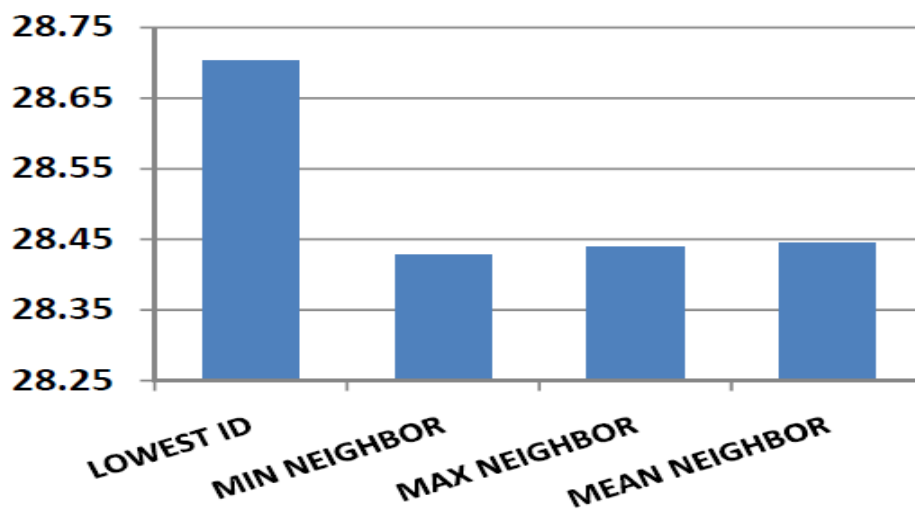

Figure 2 shows the Average Cluster of the WSN using Balanced neighborhood aware clustering technique[3]

2.3   Mobility aware reputation node ranking (MARNR) technique for wireless sensor network:-

The mobility aware reputation node ranking (MERNR)[4] mechanism are specially used for improve the clustering efficiency of hot spot region in the WNS. Nodes with minimum mobility rate threshold need to be identified. Most rate threshold is such that cover the hotspot region for specific period of time [4]. Ranking procedure is evaluated with the node based on minimum

mobility threshold and node cooper activeness factor. Cluster head of the hotspot region also ensures energy efficiency and consumption rate.

The MARNR mechanism follow as-

(A) WNS and hot spots.

(B) Energy efficient clustering.

(C) Multi hop data collection.
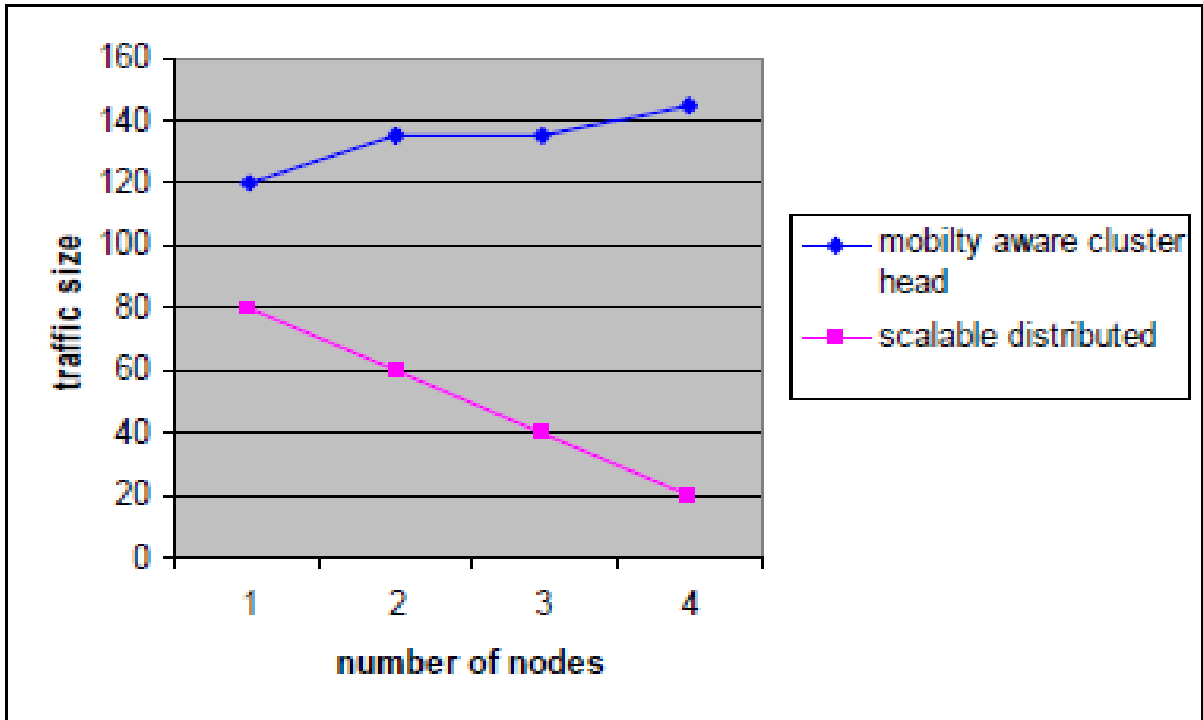
(D) Node mobility threshold.

(E) Reputation ranking

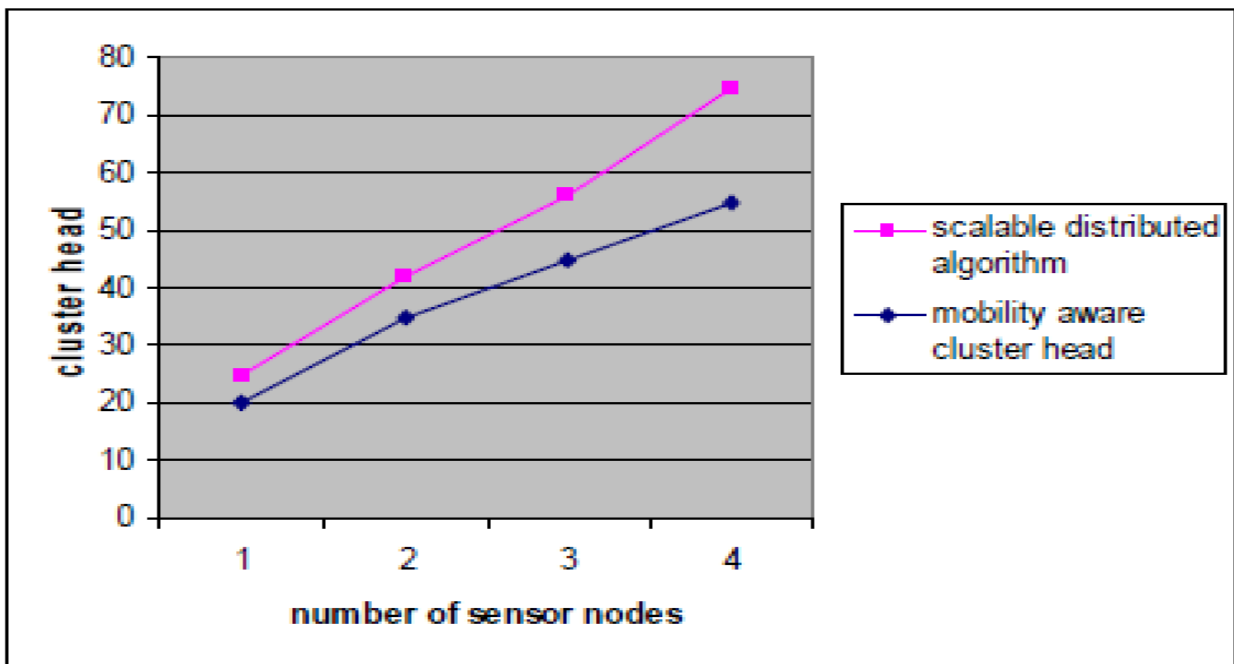**Figure 3 showing the network life time of the WSN using MARNR Technique[4]**

Figure 4 showing the cluster size of the WSN using MARNR Technique[4]

3. Conclusion:-

Energy efficiency of data gathering in WSNs is imroved, an energy (ECRA) based on clustering and tree. which integrate the hierarchical routing and tree. In the study of ECRA we see that longer lifetime, low energy consumption. In the mean neighbor clustering protocol utilizes local neighborhood information to form well balanced clusters in the networks. A important issue in the mean neighbor clustering technique is that energy utilization of individual node in the network varies in short range efficient. MARNR, suitable for multi hop data delivery scenarios in clustered WSNs. MARNR determine

the density of CH nodes in the network based on the hop distance to the network data link. MARNR extend the network lifetime and provide equalization of node energy level in particular location. MARNR are specially useful for mobile type node.

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