An Improved Local Broadcast Transmission Reduction Technique in Wireless Networks

K.Radhika,
Mtech student Department of Computer Science & Engineering, Gudlavalleru Engineering College, Gudlavalleru , Andhra Pradesh, India.

Ch. Suresh Babu M.Tech,(Ph.D)
Associate Professor *Dept of CSE, Gudlavalleru Engineering College, Gudlavalleru , Andhra Pradesh, India.*

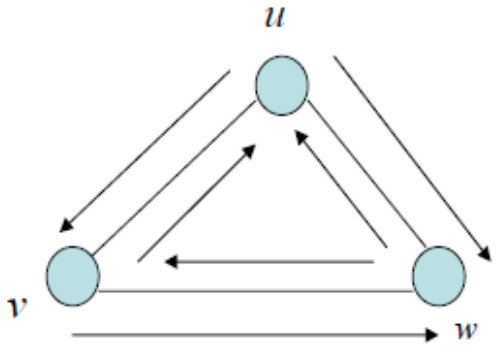
Abstract **– Broadcasting is a common and basic operation designed to support various network protocols in wireless networks. To produce energy efficient broadcasting is very important for unplanned wireless sensor networks because sensors are typically combined with batteries with limited lifetimes. Two primary techniques, static and dynamic, to real broadcast algorithms in wireless ad hoc networks. Among the unchanging technique, local algorithms identify the status of each node proactively based upon local topology information. The hybrid local broadcast algorithm based upon dynamic approach is proposed for guarantee with full delivery and successful approximation onto the optimum solution without thinking about the node position. In dynamic approach the position of this very node is resolute "on-the-fly" dependent on local topology information. So, it is feasible to have the good approximation factor into the optimum solution. The positioning details are the solution to obtain good approximation factor. However in some applications it might not be a possibility get position information as a consequence of nature of unplanned networks that allow mobility cause dynamic, unpredicted and frequent topology changes.**

Keywords –Local algorithm, Adhoc ,Routing.

I. INTRODUCTION

A wireless unplanned network is an interconnection of mobile computing devices, in which the link between two neighboring nodes is established via radio propagation. Neighboring nodes can communicate directly when they are within transmission choice of each other and radio propagation condition around about these nodes is adequate. Communication between non-neighboring nodes requirements multihop routing protocol. Within the multi-hop wireless network, each node has got a transmission radius and is able to send a packet to all its neighbors which get located within the radius. In a broadcasting task, a source node sends the same packet to the nodes in the network. It can be a key task applied to paging, alarming, location updates, route discoveries or possibly routing in highly mobile environments.

A straight forward approach for broadcasting is *blind flooding*, in which each node will be obligated to rebroadcast the packet whenever it receives the packet for the first time. It may generate redundant transmissions. Figure 1 shows a network with three nodes. When node *u* broadcasts a packet, both nodes *v* and *w* will receive the packet. Then *v* and *w* will rebroadcast the packet to each other.



Redundant transmission by blind flooding.

In unplanned wireless sensor networks, it's a popular operation to send one message from one identified source node to all other nodes. Such kind of operation is generally called broadcasting, which can be used several scenarios, i.e., network topology discovery processes, network configuration processes, routing processes, and many more. Moreover, broadcast operations in wireless sensor networks are generally separate from those within wired networks because multiple nodes may well be reached by way of a single transmission without the additional cost according to the sender side. Generally, inside the case whereby a message is distributed from the source to all nodes, it can be generally considered a broadcast tree a situation where the source node acts as the tree root and of course the other nodes have their separate parents, and to discover the non-leaf nodes shall relay and forward what it s all about for their children after reception.

To supply an efficient solution for the challenge with consideration of energy consumption is a crucial issue in wireless sensor networks. As stated, sensor nodes is usually supported with limited energy budget, and energy efficiency is a crucial issue in wireless sensor networks. Radio waves serves as a main method to obtain energy consumption in wireless sensor networks, that's generally comprised with three parts, namely, transmission power, reception power and idle power, and of course the idle power is small sufficient to be ignored compared with the other two [1]. Since all nodes within the network shall receive messages as soon as the broadcast process is finished, energy consumption is accordingly influenced by energy cost through the transmission process. In case that the transmission range is identical for nodes in the network, the minimum-energy broadcast problem is transformed into the problem of meeting a spanning tree with the use of a minimized range of non-leaf nodes.

In this paper, a new broadcast technique has been proposed based on 1-hop neighborhood information. An algorithm based on this technique utilizes neighborhood information more effectively, termed as Improved local algorithm. Simulation results of applying this algorithm shows performance improvement with compared to existing *Dominant pruning* and *Total dominant Pruning* algorithms used for broadcasting in ad hoc wireless network.

II. LITERATURE SURVEY

Several Works & studies are performed for broadcasting in Unplanned wireless networks. These works are considered as follows: - Lim & Kim provide two approximation algorithms: self pruning & dominant pruning. In [3], Stojmenovic studied a connected-dominant-setbased broadcast algorithm that makes use of only internal nodes to forward the broadcast packet. Internal nodes are dominating nodes derived by Wu and Li's marking process [3]. Calinescu [4] proposed a location-aware pruning method that extends the work of Lim and Kim. It is shown that the resultant dominating set possesses a constant approximation ratio of 6. In this paper, it has been assumed that each host has no location information of other hosts and then we will compare with just those protocols that don t rely on location information. Among the works performed for reducing broadcast redundancy in Ad hoc wireless networks, the efficient and attractive works are dominant pruning and total dominant pruning.

Dai and Wu [2] extended the Wu and Li's algorithm by using a more general rule called Rule k. A gateway becomes a non-gateway if its neighbor set is covered by k other nodes that are connected and have higher priority values.

Chen et al. [1] proposed the Span protocol to construct a set of forwarding nodes called coordinators. A node v becomes a coordinator if it has two neighbors that cannot reach each other by either directly connected, indirectly connected via one intermediate coordinator, or indirectly connected via two intermediate coordinators.

III. PROPOSED SYSTEM

Algorithm shows our proposed hybrid broadcast algorithm. Whenever node u gets message m, it creates opt in if it's not created yet and updates a list as explained earlier. Then, based upon whether u was selected to forward or if the coverage condition is satisfied, u may plan a broadcast by placing a copy of m in the MAC layer queue. You will find not less than two sources of delay among the MAC layer. First, information most likely are not at the head of this very queue so it has to await other packets to become transmitted. Second, in contention based channel access mechanisms for instance CSMA/CA, to stay clear of collision, a packet at the head of this very queue must wait for a random period of time before obtaining transmitted. In this paper, we assume that a packet can be removed seen from the MAC layer queue if it's don't needed to be transmitted. Therefore, the published algorithm has access to two functions to manipulate the MAC layer queue. The initial function will be the scheduling/placing function, used to put a message inside the MAC layer queue. We assume that the scheduling function handles duplicate packets, i.e., it doesn't position the packet within the queue in case a copy of your new toy has been in the queue. The next function is termed to remove a packet build queue (quite simple do anything if the packet is not inside the queue).

The proposed broadcast algorithm serves as a hybrid algorithm, because every node that broadcasts the answer may select some of its neighbors to forward what it s all about [3]. In this proposed broadcast algorithm, every broadcasting node selects at the most one among its neighbors. A node has to broadcast what it s all about if it's selected to forward [1]. After determining the minimum wide range of nods to forward the answer, the covered area will certainly be created. To assess the coverage condition, every node maintains some neighboring nodes. Every node maintains its neighbor node information with its id number. The most suitable number is used to discover the spot where destination node. After collecting the message, a node should be creating the coverage area with its id large number of neighboring nodes. For example, a node one sends the most suitable number for requisition into the neighboring node second. When the message is received from its neighboring node number two, second node doesn't choose node one and node three to broadcast the answer. Observe that the third node is probably not a neighbor of first node. However, ever since the third node is naturally a neighbor of second node, it is at the most 2 hops away from first node. Having id's of second and third node are kept in the covered area details. Since the third node will eventually broadcast what it s all about, by updating a list, the initial node removes those neighbors which may have received the message or will receive it, eventually. When the first node high thc copy of message and it should be up dated inside the selection of that node. If the first node is chosen via the second node to send the answer, the neighbors of second node is deleted among

the group of first node. Because the first node ought to be update the present level to stay clear of the waste transition[5].

The proposed hybrid algorithm executed by u

1. Extract intrusion detection system ids of broadcasting node and
   The selected node form the receivers message m
   .
2. if u has the broadcast the message m before then
3. discard the message m
4. return
5. end if
6. if u receives m for the first time then
7. create and fill the list list(m)
8. end if
9. update the list list(m)
10. Remove the information added to message m by the previous Broadcasting node
11. If list(m)!=null
    Then
12. Select an id form list(m) and add it to the Message m
13. Schedule the message
    {
14 If m is already in the queue
   Then update the id
   Else
   List(m)=null
15 If u was selected then
   Schedule the message
   Else
   Remove the message from the queue if u has not Been selected by any node before
16 End if
17 End if

Deletion of unwanted node information

The first node discards a received message if it has broadcast message before. If the first node is selected to forward the message, it schedules a broadcast and ever removes the messages from the queue in future. The first node may change or remove the selected node's id from the scheduled message every time it receives a new copy of the message and updates the list[1].

Scheduling and Removing function

In the neighbor-designating method the forwarding status of the each node is determined by its neighbor. The source node selects a subset of its 1-hop neighbors as forward nodes to cover 2-hop neighbor. A node determines whether its neighbors should forward broadcast packets. When a first node receives a message, it creates a list if it is not created yet and updates the list. Then, based on whether the first node was selected to forward or whether the coverage condition is satisfied, the first node may schedule a broadcast by placing a copy of message in its Medium Control Access (MAC) layer queue.

Collection of Neighbor Node List Information

In wireless ad hoc networks, the fundamental operation of network is broadcasting. The broadcasted node will be selected with respect to the flooding. Before using this method, the blind broadcasting method is used for selecting the nodes [2]. In which the source node will send the request to the neighboring node. After receiving that request, the received node has the sender node information in its header or its nodes memory. Every node has some range power, that node covers the other nodes which are all comes under that range. So the broadcasted request is wasted on its discovery time period.

Evaluation metrics: The metrics used in this evaluation are defined as follows:

Packet delivery ratio: It is the ratio between the number of packets that are successfully received and the total number of packets sent.

Packet loss ratio: It is the number of data packets lost divided by number of lost packet and number of packets received successfully.

Packet drop: It is the number of data packets dropped by the intermediate nodes due to congestion or collision.

Routing Overhead:

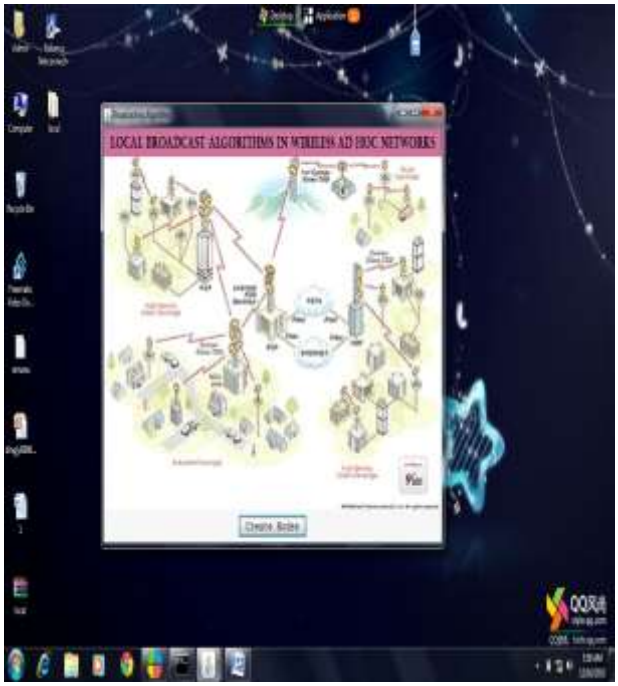
The number of control packets for the routing protocol over the number of data packets sent. Average End-to-End Delay:

Time taken for the packets to reach the destination.

Normalized routing load:

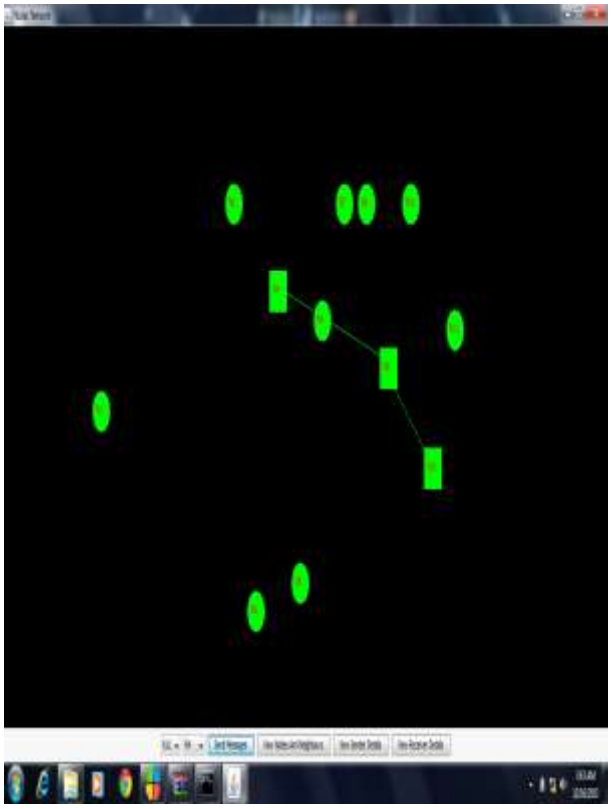
It is the ratio between the number of routing packets sent by all the nodes for route and discovery and the number of data packets delivered to the destination nodes.

IV. RESULTS

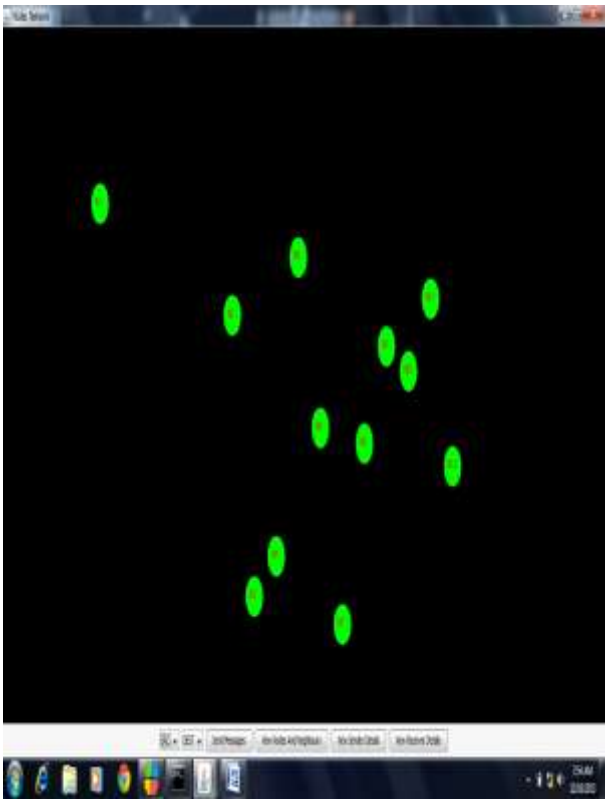


Homepage of local broadcast algorithms in wireless networks

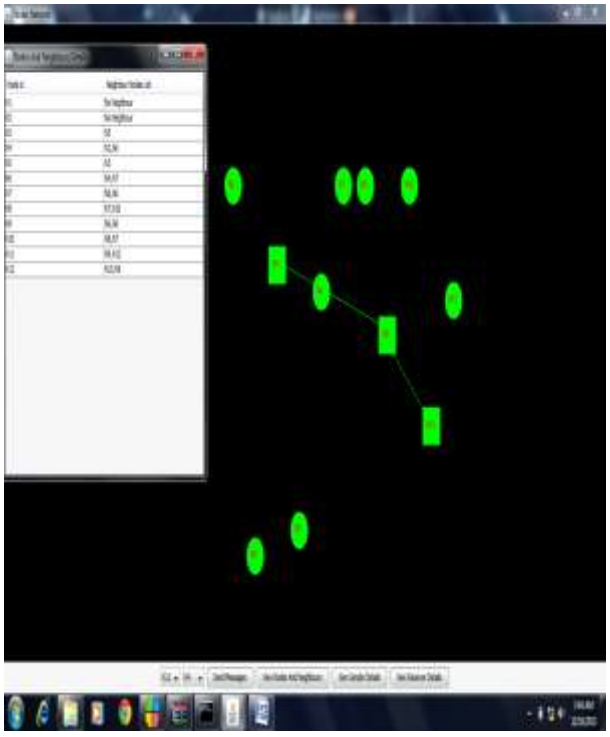
Wireless network constructed with the specified nodes



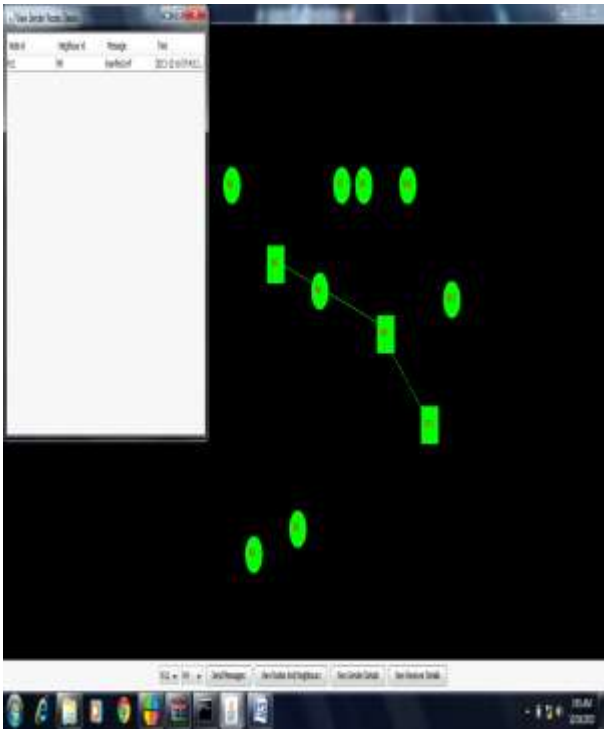
Enter number of nodes to construct wsn



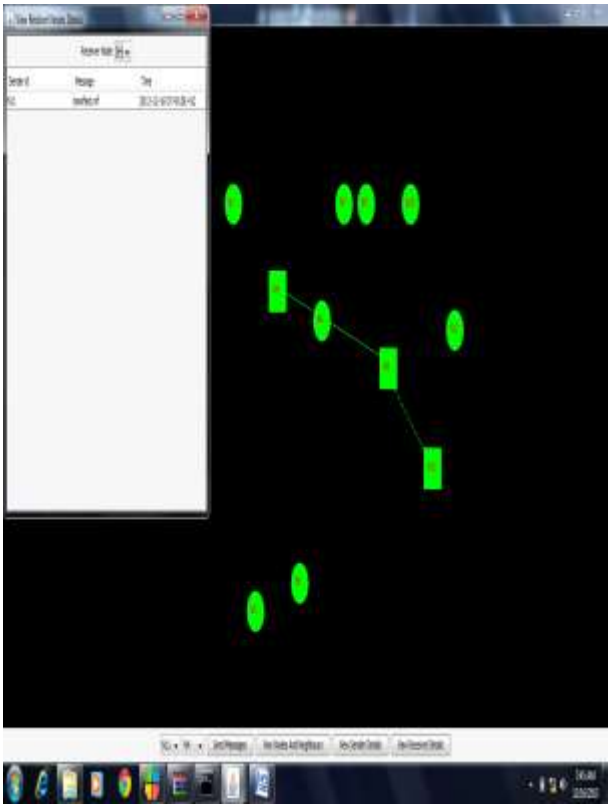
Path construction between sender and receiver nodes



Node neighbor details



Sender node details



Receiver node details

V. CONCLUSION AND FUTURE SCOPE

In local broadcast algorithm, the number of transmission rates is high for broadcast. Local broadcast algorithms based on static approach cannot guarantee a small sized CDS if the position information is not available. The position information is the solution for getting good approximation factor. Even though mobility problems the proposed hybrid algorithm which is the combination of self-pruning algorithm and neighbor-designating algorithm reduces bandwidth utilization and eliminates overhead. The proposed algorithm provides good approximation factor for optimum solution. So the number of transmission rate is reduced that are required to achieve the full delivery in packet ratio with energy consumption using local broadcast algorithm based on dynamic approach.

REFERENCES

[1] A Hybrid Local Broadcast Algorithm in Wireless Ad Hoc Networks using Dynamic Approach
R.Madhanmohan. International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 2, Issue 4, April 2013.
[2] S. Ni, Y. Tseng, Y. Chen, and J. Sheu, "The Broadcast Storm Problem in a Mobile Ad Hoc Network," Proc. ACM MobiCom, pp. 151-162, 1999.
[3] J. Wu and F. Dai, "A Generic Distributed Broadcast Scheme in Ad Hoc Wireless Networks," IEEE Trans. Computers, vol. 53, no. 10, pp. 1343-1354, Oct. 2004.
[4] Khaled Alzoubi, Xiang-Yang Li, Yu Wang, Peng-Jun Wan, and Ophir Frieder, "Geometric spanners for wireless ad hoc
networks," IEEE Transactions on Parallel and Distributed Processing, 2003, Short version in IEEE ICDCS 2002.
[5] Local Broadcast Algorithms in Wireless Ad Hoc Networks: Reducing the Number of Transmissions Majid Khabbazian, IEEE TRANSACTIONS ON MOBILE COMPUTING, VOL. 11, NO. 3, MARCH 2012
[6] S. Ni, Y. Tseng, Y. Chen, and J. Sheu, "The Broadcast Storm Problem in a Mobile Ad Hoc Network," Proc. ACM MobiCom,
pp. 151-162, 1999.
[7] Z. Haas, J. Halpern, and L. Li, "Gossip-Based Ad Hoc Routing," Proc. IEEE INFOCOM, pp. 1707-1716, 2002.
[8] D.Y. Sasson and A. Schiper, "Probabilistic Broadcast for Flooding in Wireless Mobile Ad Hoc Networks," Proc. IEEE Wireless Comm. and Networking Conf., pp. 1124-1130, 2003.
[9] H. Liu, P. Wan, X. Jia, X. Liu, and F. Yao, "Efficient Flooding Scheme Based on 1-Hop Information in Mobile Ad Hoc Networks," Proc. IEEE INFOCOM, 2006.