Performance Analysis Of Guaranteed Packet Transfer In Coverage Area And Less Coverage Area For MANET

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Abstract

The main challenge in mobile adhoc network is guaranteed transfer of packet within coverage area and less coverage area. The hierarchical clustering is used to increase coverage area to reduce the packet loss in MANET.The coverage area, packet loss is analyzed and reliability of coverage area and less coverage area is increased by hierarchical clustering.The traffic can be reduced and packet loss will also be minimized and it achieves guaranteed transfer of packets. Every node is updated with the neighbored information in a timely manner to achieve guaranteed coverage and to increase the packet delivery ratio and reduce end to end delay.

Index Terms—MANET ,QOS, Neighboring Nodes, Clustering, Graph, Adhoc, Guarantee, Network .

I.Introduction

MANET is formed by a set of mobile wireless devices with no fixed topology. The nodes can move freely, leave and enter the network at anytime. Mobile ad hoc networks (MANET) consist of hundreds to thousands of small, low-cost, low-powered sensor nodes, where the nodes are densely deployed across certain geographical areas. Since these sensor nodes have a severe limitation in their storage, radio communication, capabilities, bandwidth, and energy, the most important design consideration for MANET is to extend their operational lifetime by minimizing power consumption. This is the reason why protocols with low energy consumption have been an important research orientation in this field.

1.2 Manet Routing Protocols

Dynamic Source Routing (DSR) ,Adhoc Ondemand DistanceVector(AODV), Zone Routing protocol(ZRP), Location Aided Routing(LAR), ProactiveRoutingPtocols(PRA) Temporally Ordered Routing (TOR).

2.Qos Factors

2.1 Throughput is the total number of packets received by the destination.

2.2 End to End Delay is the average end to end delay of data packets from senders to receivers.

2.3 Media Access Delay is the media transfer delay for multimedia and real time traffics' data packets from senders to receivers.

2.4 Packet delivery ratio (PDR) is the ratio of the number of data packets received by the destination node to the number of data packets sent by the source node.

2.5 Routing load specifies the load over communications links for traffic flow.

3. Broadcasting Methods

3.1 Probability Based Method - Source node broadcasts the packet to all its neighbors. Some neighbors nodes rebroadcast the packet. The selection is based on predetermined probability. When the probability is 100%, this scheme is same as simple flooding. This method is well suited for dense networks. For sparse networks, all the nodes might not receive the packets. Based on the understanding that in a dense network, nodal and network

resources can be save by having some nodes not rebroadcast the duplicate networks. A more refined probabilistic scheme is a counter-based approach in which upon receiving a broadcasted packet, the current node applies a Random Delay Time (RDT) before it determines whether or not to rebroadcast packet[11].

3.2 Area Based Method In the area based method, the packet is re-broadcasted only if the node covers a significant amount of area than the sender who sent the packet. Suppose a node receives a packet from a sender that is located very close to it. If the receiving node rebroadcasts, the additional area covered by the retransmission is low. If the receiving node is located at the boundary of the sender node's transmission distance, then a rebroadcast would reach significant additional area. intermediate nodes will evaluate additional coverage area based on all received duplicate packet. We can image that in a dense network there may be multiple nodes which are located very close to each other. In such situations, the majority of the coverage areas of these nodes overlap each other. Based on estimated distance or location information, an intermediate node will determine whether or not to rebroadcast the received packet[11].

3.3 Distance-Based Method A node using the Distance-Based Scheme compares the distance between itself and each neighbor node that has previously rebroadcast a given packet. Upon reception of a previously unseen packet, a RAD (Random Assessment Delay) is initiated and redundant packets are cached. When the RAD expires, source node location is examined to see if any node is closer than a threshold distance value. If true, the node doesn't rebroadcast. [12]

3.4 Broadcasting methods Broadcasting methods have been categorized into four families utilizing the IEEE 802.11 MAC specifications. Note that for the comparisons of these categories the reader is referred to[12]

3.5.Simple flooding Can be used as a simple protocol for broadcasting and multicasting in ad hoc networks with low node densities and/or high mobility .[12]

3.6 Neighborhood knowledge based methods
A node will determine whether or not to rebroadcast based on its neighbor list. Upon receiving a broadcasted packet, a node will check the previous node's neighbor list which is included in the packet header. If it turns out that it would not reach any additional nodes, it will decide not to rebroadcast the packet.[5]

4 .Clustering
Connecting two or more interconnected computers together in such a way that they behave like a single computer. Clustering is used for, and higher availability, higher scalability or both[4].

5.Proposed Method
The basic principle behind hierarchical clustering is the following: If there are m input points (or data items), we start with n clusters where each cluster has a single point. From there on, the "closest" two clusters are identified. The
Distance between two clusters can be defined in many ways.

The two closest clusters are merged, resulting in a reduction in the number of clusters (by one). This process of merging is continued until the number of remaining clusters is q (where q is the target number of clusters and could be a part of the input).

There are many ways in which the distance between clusters can be defined [12]. The metric that is commonly employed is the single link metric. Here, the distance between two clusters is defined to be the minimum weight of any edge connecting a point in one cluster with a point in the other. In this paper, a single link metric is employed as well.

7.Motivation And Related Work
There are several standard techniques proposed to identify clusters in a graph .These can be broadly classified into Identifier –Based and Connectivity –Based Cluster- head selection techniques.

The popular Techniques are the lowest ID and the Maximum –Connectivity.

In the Former case, if a Low-ID node ever gets highly mobile ,this could result in unacceptably large number of cluster head changes.

In the Maximum connectivity as well as lowest distance value cluster, the clustering changes from one mobile node to another depending on the activity coverage area. The cluster based on mobile nodes observed over a long period of time.

In the Proposed algorithm, a path is defined as the most reliable within the graph, through which delivery is guaranteed .In the ideal first identified the coverage area range .

The transferring packet with in the coverage area and calculate the time taken for transferring a packet. Next compute less coverage area and transfer the packet .

First step to identify the packet transferred time and packet loss within coverage area and less coverage area. The packet loss reduce the less coverage area.

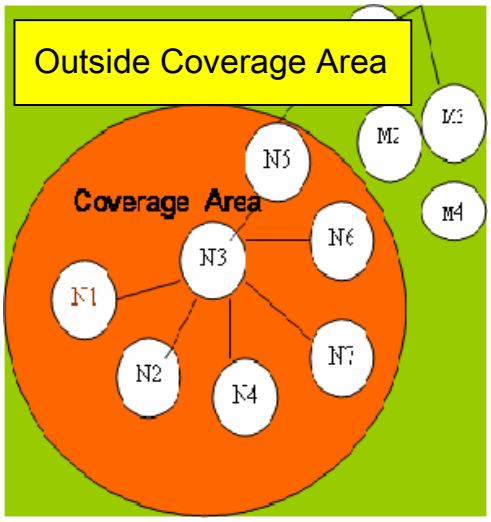

Figure -1
Coverage area and less Coverage area

XII.Simulation Results

Network Model
Sample Data

Routing Protocol	AODV,DSR
Coverage area	670 m x 670 m
Packet Size	512
No. of Nodes	10,20,30
Algorithm	Random casting

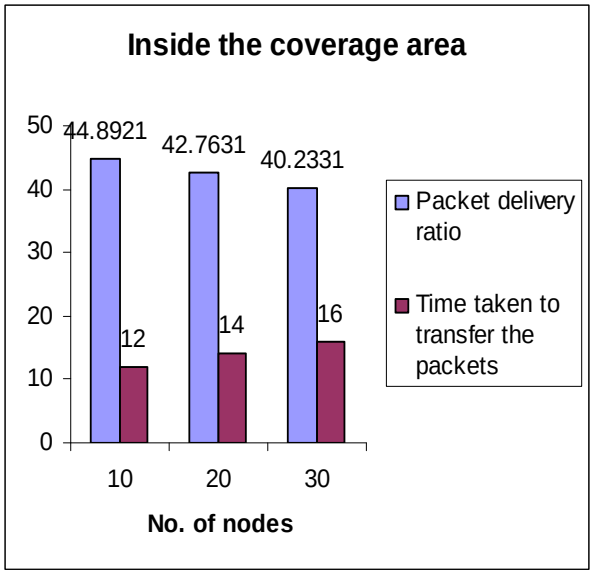

Figure-2 Inside the coverage area packet delivery ratio and time taken to transfer the packets

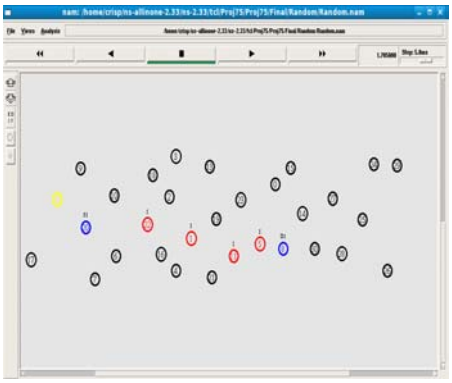

Figure3. Node Creation

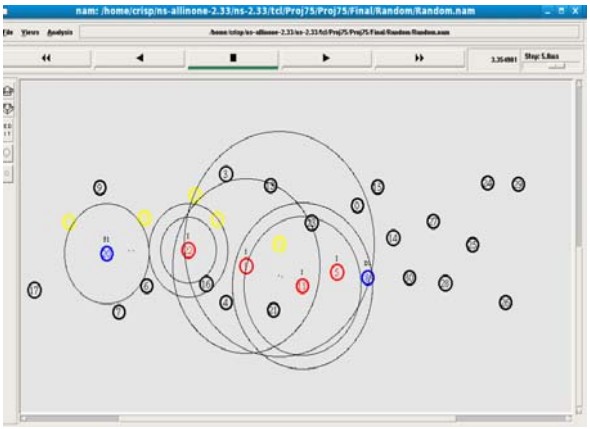

Figure 6 :Node cover for outside the coverage area

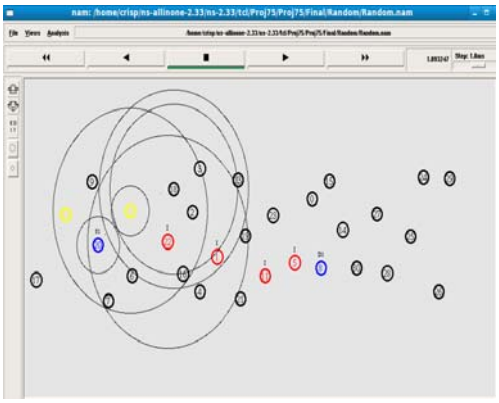

Figure 4: Node cover for coverage area

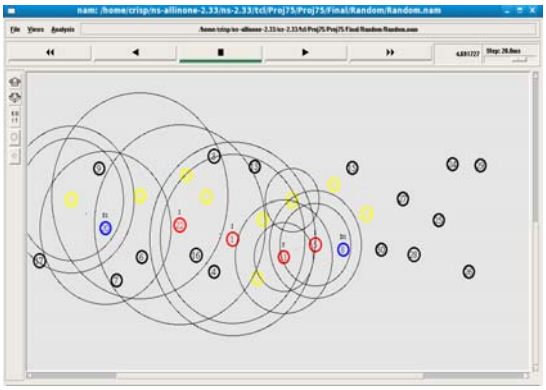

Figure 7: Node cover for coverage area and less coverage area

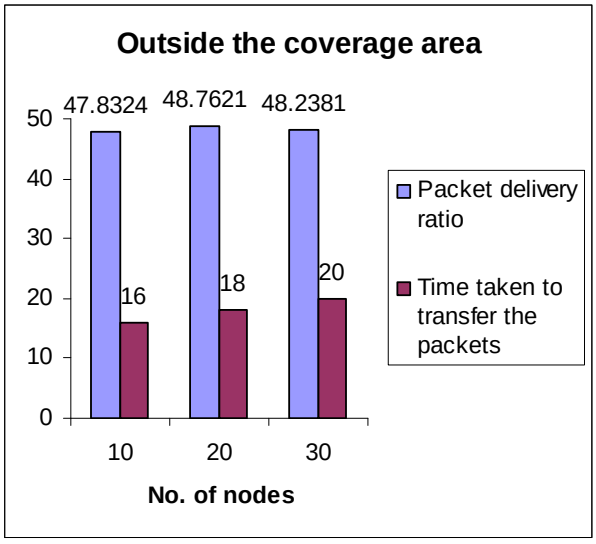

Figure-5 Outside the coverage area packet delivery ratio and time taken to transfer the packets.

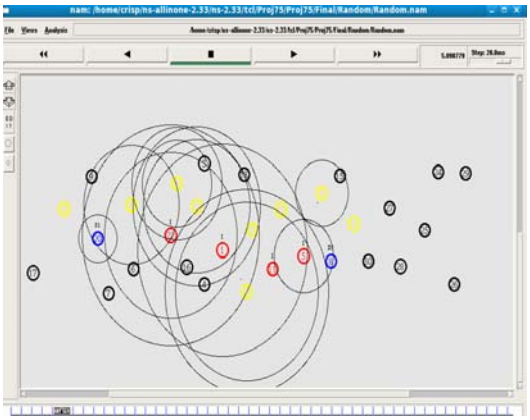

Figure 8 : Node cover for coverage area and less Coverage area packet loss

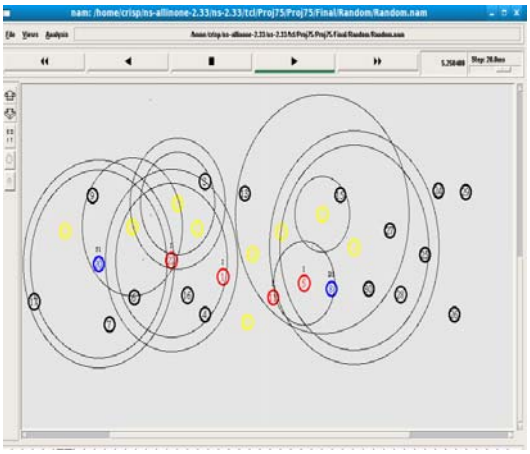

Figure 9 : Node spilt to coverage area and less coverage area

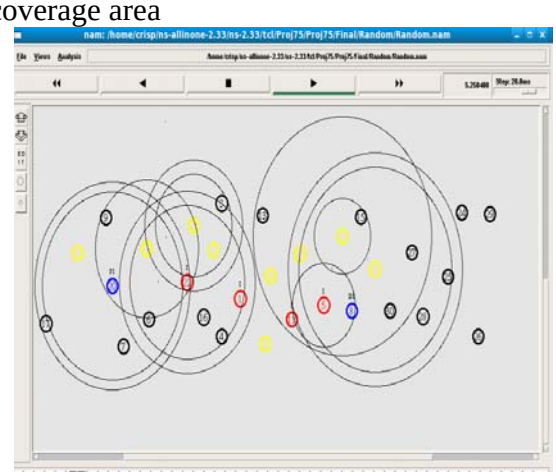

Figure 10 : Reduce the packet loss in less coverage area.

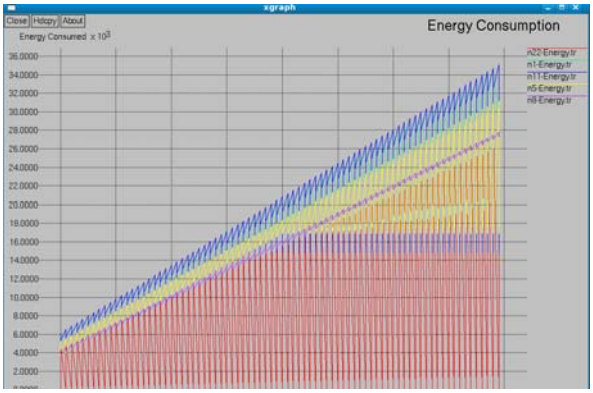

Figure11:Energy consumption for coverage area and less coverage area

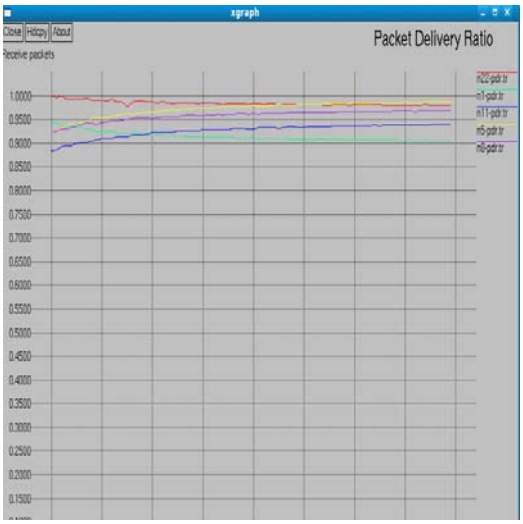

Figure 11 : Packet delivery ratio for coverage area and less coverage area

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