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Analysis of Enhanced Stable Clustering Algorithm Using NS2

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ABSTRACT

Wireless networks are becoming more popular because they are easy to use. Mobile ad-hoc networks become very important technology in the last few years because wireless devices increases. Battery power is important parameter because mobile devices are battery operated now days. There are numerous clustering algorithms for MANET environment categorized mobility aware, load balancing clustering, energy proficient approach, combined metrics based clustering. Combined Metrics based clustering algorithms are preferred as more efficient in clustering as compared with the other clustering algorithms. This paper is focused on node fidelity of mobile nodes using these two node's quality an algorithm is developed as Enhanced-NQCA algorithm which is combined metrics based approach. Results shows that Enhanced-NQCA performs better result as compared to Weight based clustering algorithm (WCA) and Node Quality based Clustering algorithm (NQCA).

Keywords : MANET, Clustering, WCA, NQCA Throughput.

I. INTRODUCTION

Mobile Ad-hoc Network (MANET) is approach without central control in the wireless system consists of free moving nodes. Wireless system getting popular due to their ease of use now a day. MANET sometimes called mobile mesh network, is self-configurable wireless network. A MANET comprises mobile nodes, router with multiple hosts and wireless communication devices. A MANET is network in which nodes connected together by wireless links without any fixed infrastructure. These networks have no fixed routers, every node could be router. All nodes capable of moving and can be connected dynamically an arbitrary manner. A mobile ad hoc network is composed of peer nodes equal networking capabilities which are able to function mobile routers forward packets and maintain routes. Packets can forwarded in multi hops from the source nodes to the destination nodes with no need for underlying fixed network infrastructure.

II. RELATED WORKS

In any network, for clustering the main goal is that information should flow among various nodes. Before the actual data transmission the control information between source and destination is exchanged and data information is routed by various nodes. If the network topology is large and dynamic then the overhead of information passing
Increases. Every clustering algorithm consists of two mechanisms, cluster formation and cluster maintenance.

Cluster head is the node which manages the cluster activities like, managing cluster process, updating routing table, and discovery of new routes. There are some metrics that used as a standard measurement to

calculate that which one is the best routing path for packets to reach the destination. Routing provide the maximum possible reliability during the routing use alternative router if an intermediate node fail.

The nodes other than the cluster head inside the cluster are called *ordinary nodes*. more. If the destination is inside the cluster, ordinary nodes send the packets to their cluster head that distributes the packets inside the cluster, or if to be delivered to other cluster then forward them to a gateway node. Routing Protocols: Routing is basically an act of moving the information from source to destination. If a source is much nearer to the destination then information sent without help of any node. At least one node is encountered if the destination is far from the source node.

1)Proactive Protocol is table driven approach where each node maintains routing table and any changes to the network topology should be updated in each routing table and it is stored reliably. During transmission, each and every node maintains a routing information table that communicates all the other nodes in the network to update the changes in network topology and this information should be reflected to all other nodes within the network.

2) Reactive (On-Demand): It is an on-demand approach in which the routes are being established only when there is a request from the sender node. When there is no route from one node to another helps in establishing a connection between them by creating route. The route is being maintained through the route maintenance function. When compared Proactive Protocol, this consumes more power with large delay. The flexible operations are done through reduced routing loads since it has no loop formation within the network.

III. PROPOSED METHODOLOGY

In the Continues process it has proposed an algorithm in which node energy is considered as a one parameter for selecting a Cluster Head. So, most suitable node which has highest battery power will be elected as Cluster Head. After selecting cluster head node; this algorithm will form the Cluster by selecting all those nodes as Cluster Member which is nearer to cluster head. In the proposed algorithm, it works for maintenance of cluster, due to this lifetime of cluster will be increased.

In a Clustering approach the mobile nodes are divided into different groups in mobile adhoc & Clustering scheme is separated into two phases:

- ✓ Formation of cluster
- ✓ Maintenance of cluster.

3.1 Evaluation Parameters

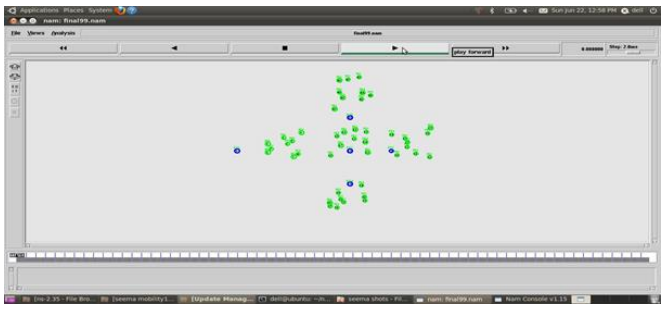
- ✓ Packet Delivery Fraction: The ratio between the amount of incoming data packets and actually received data packets.
- ✓
- ✓ Throughput: This metric represents the total number of bits forwarded to higher layers per second. It is measured in bps. It can also defined by total amount of data that can receiver actually receives from sender divided by the time taken by the receiver to obtain last packet.

Table-1: Experimental parameters

Simulation Parameters	Values
Dimension of Space	1000*1000
Protocol	AODV
No. of Nodes	20, 30, 50
Ns2 Version	ns-2.34
Simulation Time	150s
Packet Size	512 bytes
Type of Traffic	Constant Bit Rate
Node Placement Strategy	Random
Mobility Model	Random Way Point

IV. SIMULATION RESULTS

In the proposed clustering scheme, there are mainly two scenario considered as (1) with two clusters & (2) with three clusters.



Here figure 4.1 is showing the clustered architecture of network node placement. The network is divided in 5 clusters at the initial phase. The cluster member selection is here defined under the distance parameter.

Figure 4.2: Clustered Architecture (Coverage Range)

Here figure 4.2 is showing the clustered architecture of network node placement. The network is divided in 5 clusters at the initial phase. The cluster member selection is here defined under the distance parameter. Here the blue nodes represents the cluster nodes and the green nodes represents the energy effective mobile nodes. The circles are defined to represent the coverage of nodes.

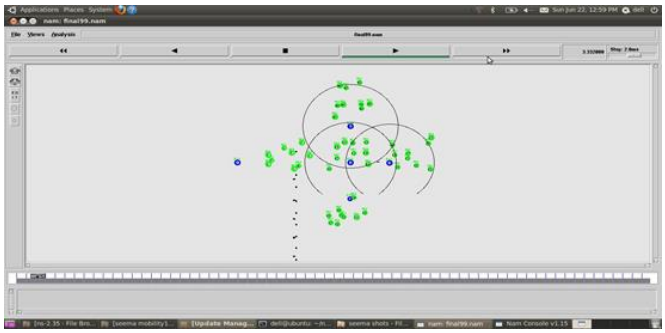


Figure 4.3 : Clustered Architecture (Communication)

Here figure 4.3 is showing the clustered architecture of network node placement. The network is divided in 5 clusters at the initial phase. The cluster member selection is here defined under the distance parameter. Here the blue nodes represent the cluster nodes and the green nodes represent the energy effective mobile nodes. The network nodes represent the route based communication over the network. The figure is also showing the data drop over the communication.

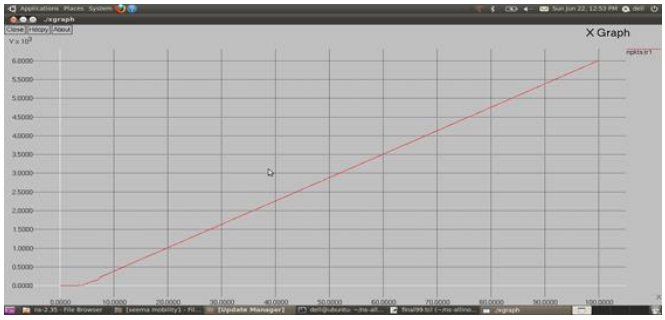


Figure 4.4: Packet Transmission Analysis

Here figure 4.4 is showing the packet communication analysis over the network. Here X axis represents the simulation time and y axis represents the packet loss over the network. Figure shows that the communication is being increased over the networks.

V. CONCLUSION

A mobile network is one of the most busy and required public area networks. One of the most challenging properties of mobile network is mobility vector. The nods work is defined in the form of cluster network. Here the nodes are defined with energy constraint. The clusters are initially created in the form of distance based analysis. The work is here

defined in the form of clustered mobile communication in real scenario. In this work, directional mobility model is considered for communication over the mobile network. Here the inter cluster and intra cluster communication is performed over the network. The work includes the cluster based communication within the network for both inter and intra cluster communication. The intelligent cluster selection technique is defined based on throughput, capacity and idle rate based evaluation. The work is here been implemented in NS2 environment. The analysis of work is done under different parameters such as packet transmission, loss rate, communication rate and communication delay.

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