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Assurance of Mobility in MANETS using Ensemble Route Recovery Process

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Abstract: ***Manet's are also called as mobile ad hoc networks. In Manet's, most of the link breakages are happen frequently because of the nature of the network. This may cause the path failures and route discoveries. The basic feature of the manet is the overhead of a route discovery cannot be neglected. In the discovery of route, broadcasting plays a major role in basic and efficient data distribution techniques, because of manet's node unseeingly shows the route which is received firstly to request packets when the route has the destination, this may cause the broadcast storm problem (BSP). In this paper, the Ensemble Route Recovery Process (ERRP) for reducing routing overhead in MANETs. Obtaining the routes dynamically for the nodes to transfer the data is done with this ERRP. The improvement of route overhead is more compare with various existing systems. The parameters shown in this system are accuracy and time taken for the data transfer and route discovery.***

Keywords: Manet's, routing, rebroadcast.

I. INTRODUCTION

These days, in perspective of energetic movement of remote correspondence field, a period of Ad-hoc forms, Mobile Ad-hoc network (MANETs) has extended developing idea of the experts. MANETs is a remote system, seriously binding a correspondence plan with no concentrated control and past structure foundation [1]. Figure 1 shows an advantageous mobile ad hoc network with 8 nodes.

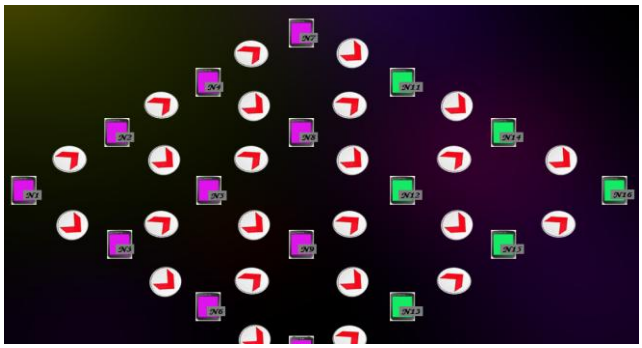

Figure: 1, Network setup

It is very difficult in MANET's to find the route of the nodes because of the unpredictable nature of the network. Then again some captivating character of such system like dynamic changes in topology, flexibility designs, moving thickness after some time, channel darkening, and insecure correspondence conditions present different exceptional research inconveniences for controlling customs being utilized in MANETs. From the previous references, many of the techniques, algorithms and other types of methods are proposed as the alternative route to overcome the issues in the MANET's.

Some authors introduced the various protocols and algorithms to overcome the issues in the Network [2]. In this paper, the focus is to overcome the issues in alternative routes and distributing data without any loss. This will overcome the routing issues in the network and data transfer accuracy is more high compare with previous systems.

II. RELATED WORK

In this section various manet's protocols are discussed with the performance of existing algorithms are described.

The author [3] introduces the new protocol which make changes to the broken or failed node. Many routing protocols are has the high data transfer rate such as AODV and DSR. Many comparative terms such as data delivery rate, overhead control under the heavy and very less traffic environment and this will improve the data delivery packets and maintenance of the route.

The author [4] explains about the various physical properties of manets are fast and unpredictable. The disadvantage of this is has very low overhead. In this system, to overcome the low overhead the irtual grid architecture (VGA) for multiple networks are introduced in manets [6] [7].

Static Approach: The routing is the most important role in this system which have only static route to maintain the communication between the nodes [5]. The effective mechanism for the route recovery is broadcasting. The main issue in this network is routing overhead for the high dimensional networks and this is also time taking process.

Static Route-Path-1 Node [1, 2, 5, 8, 12, 14, 16]

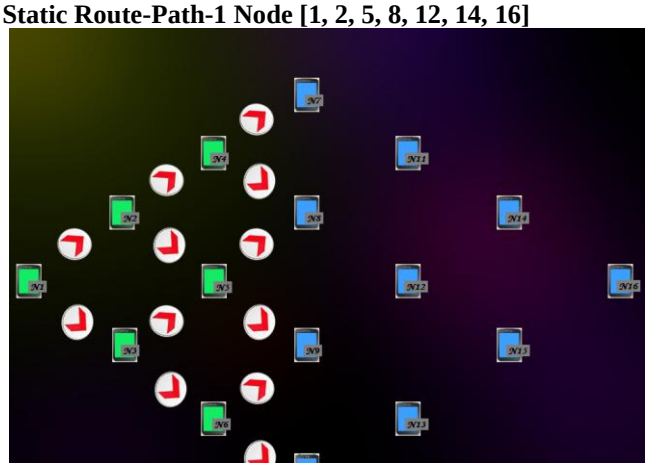

Figure: 2, the communication between the nodes

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Ensemble Route Recovery Process (ERRP)

After the network setup with the no of nodes. Various issues can be seen in the network to transfer the data from source node to destination node. The proposed system calculates the rebroadcast delay and rebroadcast probability for the node network [6]. Computation time for route discovery is calculated.

The rebroadcast delay T_d (n_i) of node n_i is defined as follows:

T_d **(n_i) = H_d x T_p (n_i)**

Where **T_p (n_i)** is the delay ratio of node ni.

For the dynamic approach there are four routes

Path-1: Node [1, 2, 5, 8, 12, 14, 10]

Path-2: Node [1, 3, 6, 9, 13, 15, 16]

Path-3: Node [1, 2, 5, 9, 12, 15, 10]

Path-4: Node [1, 2, 4, 8, 12, 14, 16]

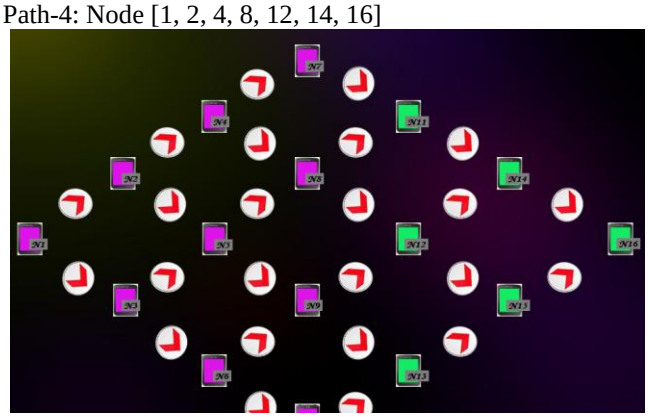

Figure: 3, the communication between the nodes

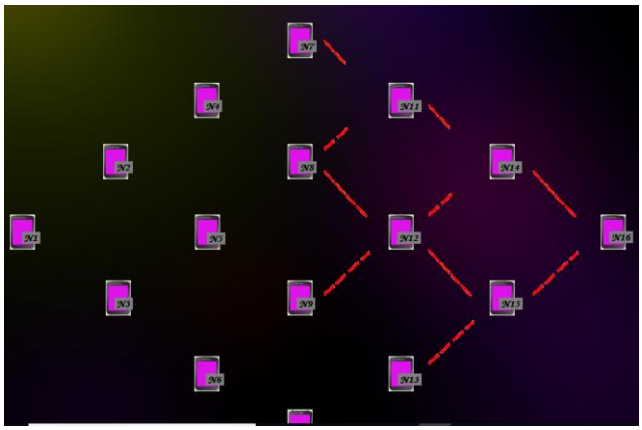

Figure: 4, the communication between the nodes

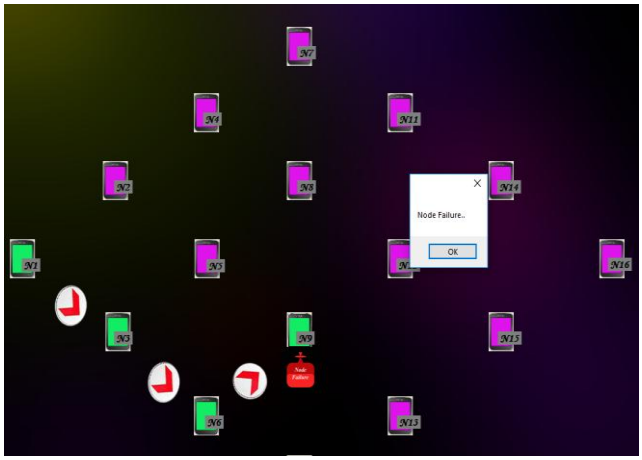

Figure: 5, the failure of node identified by the proposed algorithm (Path-1)

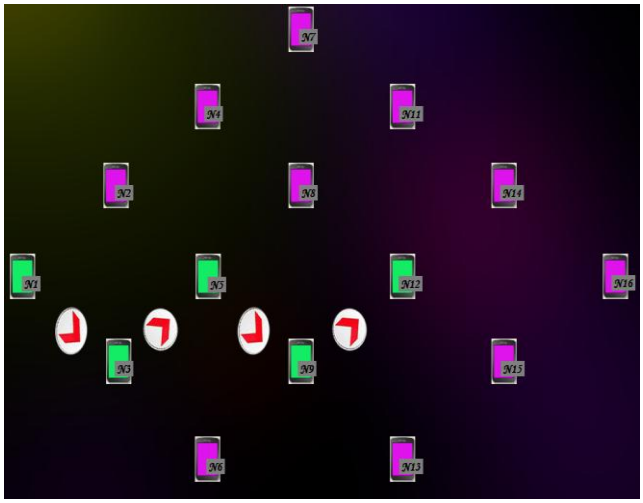

Figure: 6, the path changed to Path-3

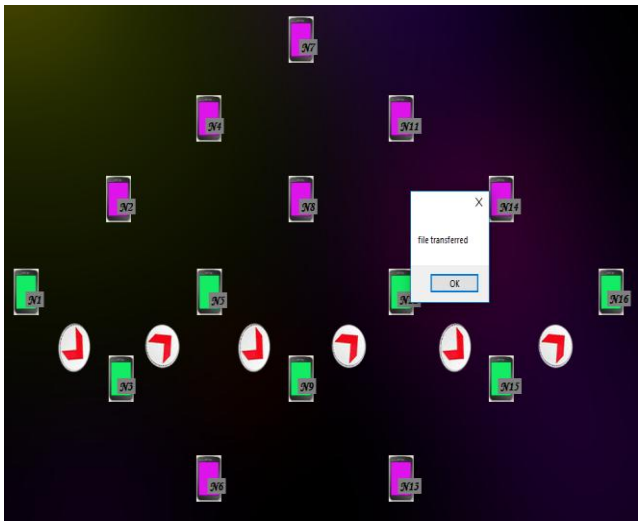

Figure: 7, the path completed and file transferred

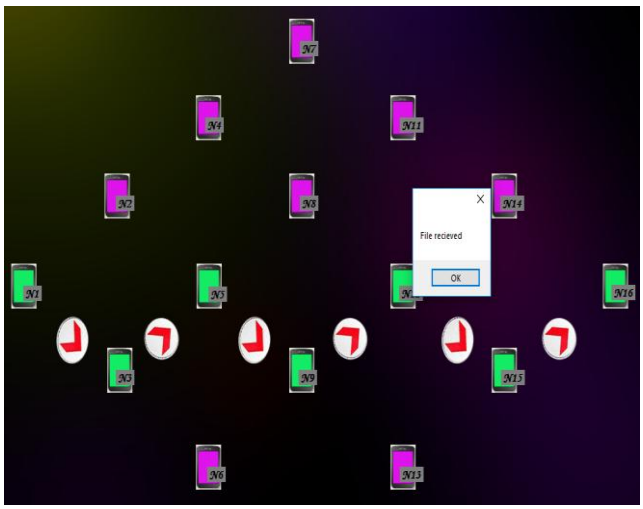

Figure: 8, the path completed and file received

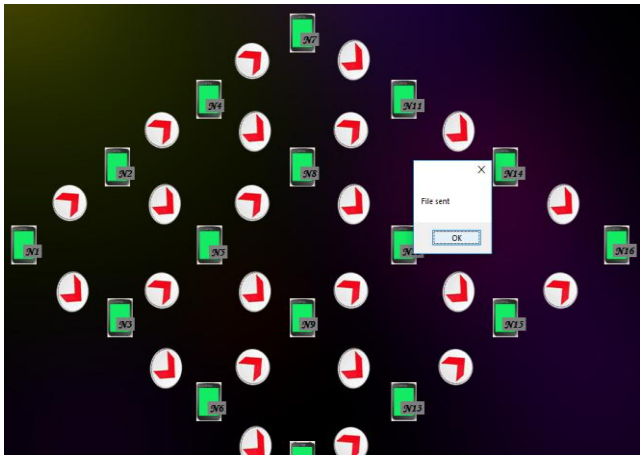

Figure: 9, the path completed and file sent

The path discovery is done by the **ERRP** which utilized the random approach for the path selection [8].
Total number of paths p.
Consider the path 'a' in an array of p paths.
Input: An array of p≥2 elements, in which half are 'a's and the other half are 'b's.
Output: Find path 'a' in the array.

```
findingB_Path(array P, p)
begin
   repeat
      Randomly select one path out of p paths.
   until 'pn' is discovered
end
```

III. RESULTS ANALYSIS

The experiments are conducted on NS3 simulation with 100-200 nodes approximately with the system configuration is 4 GB Ram and 1 Tb hard disk. Especially the comparative results are done on the performance of the existing and proposed system. The proposed system ANC-PRP will have the advanced features to improve the performance of accuracy based on the dynamic route.

Table: 1 Parameters for Simulation

Parameter	Value
Simulator	NS 3
Type of MAC	802.11
Routing Protocol	ANC-PRP
Channel Type	Wireless Channel
Total No of Nodes	100-200

Performance Evaluation

To show the improved result, the NS3 is used for simulation results. The proposed algorithm the Amalgamate Neighbor Coverage-based Probabilistic Rebroadcast Protocol (ANC-PRP) is dynamic network. The calculations are done based on dividing the normal and malicious nodes with dynamic route with immediate selection of data.
Accuracy: This will calculate the overall accuracy of the route recovery.

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN}$$

Table: 2 Show the performance for time and accuracy

	Static	Dynamic
Time (Sec)	20.121	11.231
Accuracy	56%	89%

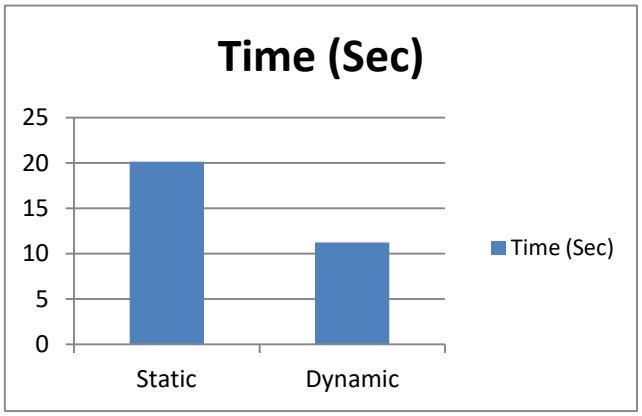

Figure: 10 Performances

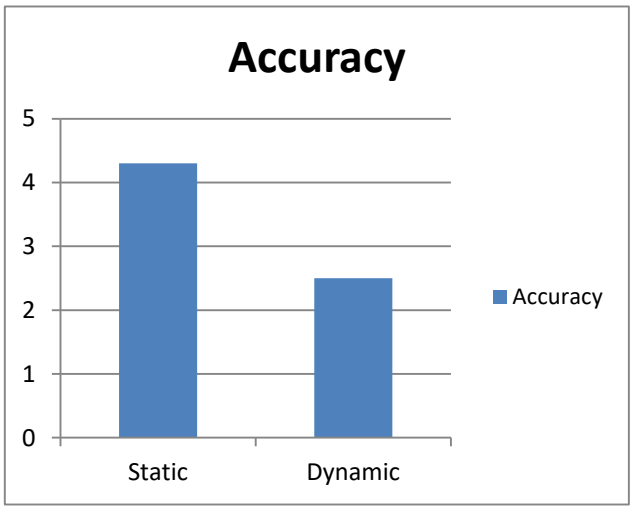

Figure: 11 Accuracy

IV. CONCLUSION

In this paper, the proposed system focuses on providing a dynamic route with better broadcasting nodes that are displayed in this network and also the other parameters are such as simulation model, size of the network, various traffic network connections and the nodes in the static and dynamic. The proposed routing protocol used to improve the alternative route with the different types of evaluation metrics for different traffic types, namely, throughput, End-to-end delay, average jitter, the average time in queue, page request time, and energy consumption.

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