

# IMPROVEMENT OF PATH IN DSR IN MANET USING AN INVERTED LIST BASED NODE ANALYSIS

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**Abstract:** In this paper, we used inverted list based approach for generating safer path and effective communication in DSR protocol. Some nodes in network can participate more frequently whereas some nodes do not participate at all. Because of this there is the requirement of such an approach that will take an intelligent decision regarding the sharing of bandwidth or the resource to a node or the group of nodes. Dynamic source routing protocol (DSR) is an on-demand, source routing protocol, where all the routing information is maintained (continually updated) at mobile nodes. DSR uses a reactive approach which eliminates the need to periodically flood the network with table update messages which are required in a table-driven approach. The intermediate nodes also utilize the route cache information efficiently to reduce the control overhead.

**Keywords:** MANET, DSR, Ad hoc, Routing Algorithm, Reverse Route.

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## I. INTRODUCTION

A mobile ad hoc network (MANET) is a kind of wireless network without centralized administration or fixed network infrastructure in which nodes communicate over relatively bandwidth constrained wireless links and perform routing discovery and routing maintenance in a self-organized way. Due to mobile nature of nodes, the network topology may change rapidly and unpredictably time to time. The network is decentralized, where all network activity including discovering the topology and delivering messages must be executed by the nodes themselves, i.e. routing functionality will be incorporated into mobile nodes. Due to these reasons routing in MANETs is a challenging task. Multicast plays an important role in MANET.

Nowadays the MANET enables many applications in the areas of emergency operations, disaster relief efforts. The Mobile Ad hoc network is one of most commonly used wireless network. As the number of user increases MANET suffer from most common network problems like congestion, packet loss, intrusion etc.

The Dynamic Source Routing protocol (DSR) is a simple and efficient routing protocol developed at CMU in 1996, specifically for use in multi-hop wireless ad hoc networks of mobile nodes. DSR allows the network to be completely self-organizing and self-configuring, without the need for any existing network infrastructure. DSR is an on-demand, source routing protocol, whereby all the routing information is maintained (continually updated) at mobile nodes. The protocol is composed of the two main mechanisms of "Route Discovery" and "Route Maintenance", which work together to allow nodes to discover and maintain routes to arbitrary destinations in the ad hoc network.

An optimum path for a communication between a source node and target node is determined by Route Discovery process. Route Maintenance ensures that the communication path remains optimum and loop-free according the change in network

conditions, even if this requires altering the route during a transmission. Route Reply would only be generated if the message has reached the destination node (route record which is firstly contained in Route Request would be inserted into the Route Reply).

The objective of this paper is Implementation of Wireless Network. Design an algorithm using inverted list approach to identify the selfish node and to perform the communication effectively. And analyze the result.

## II. RELATED WORK

Li Zhao performed a work to detect misbehavior on data and mitigate adverse effects, Author propose and evaluate a Multipath Routing Single path transmission (MARS) scheme. The MARS combines multipath routing, single path data transmission, and end-to-end feedback mechanism together to provide more comprehensive protection against misbehaviour from individual or cooperating misbehaving nodes.

Shailender Gupta defined a work on selfish node detection. A selfish node is one that tries to utilize the network resources for its own profit but is reluctant to spend its own for others. If such behaviour prevails among large number of the nodes in the network, it may eventually lead to disruption of network. This paper studies the impact of selfish nodes concentration on the quality of service in MANETs.

Debdutta Barman Roy propose a new Intrusion Detection System (IDS) based on Mobile Agents. The approach uses a set of Mobile Agent (MA) that can move from one node to another node within a network. This as a whole reduces network bandwidth consumption by moving the computation for data analysis to the location of the intrusion. Besides, it has been established that the proposed method also decreases the computation overhead in each node in the network.

Md. Amir Khusru Akhtar presented a mathematical model to detect the selfish node. In this paper Author are presenting the mathematical model to detect selfish nodes using the probability density function. The proposed model works with existing routing protocol and the nodes that are suspected of having the selfishness are given a Selfishness test. This model formulates this problem with the help of prior probability and continuous Bayes' theorem.

Zougagh Hicham performed a comparative study of intrusion detection in adhoc network. In recent years, the use of mobile ad hoc network (MANETs) has been widespread in many applications. Due to its deployment nature, MANETs are more vulnerable to malicious attack. The absolute security in the mobile ad hoc network is very hard to achieve because of its fundamental characteristics, such as dynamic topology, open medium, absence of infrastructure, limited power and limited bandwidth. In this article Author classify the architecture for IDS that have so far been introduced for MANETs, and then existing intrusion detection techniques in MANETs presented and compared. Author then provide some directions for future researches.

Michael Wayne Probus performed a work on selfish node isolation. This thesis will focus on the topic of Selfish Nodes within a Mobile Ad-Hoc Networks (MANET), specifically sensor networks due to their lower power and bandwidth. The approach used is a reputation based algorithm to isolate the selfish nodes from communication by using past history to determine how reliable the node is. The reputation of each node is determined by their behavior within the network. As a node continuously acts selfishly, their reputation is decreased, until finally meeting the minimum threshold; therefore they are determined to be malicious.

## III. PROPOSED WORK

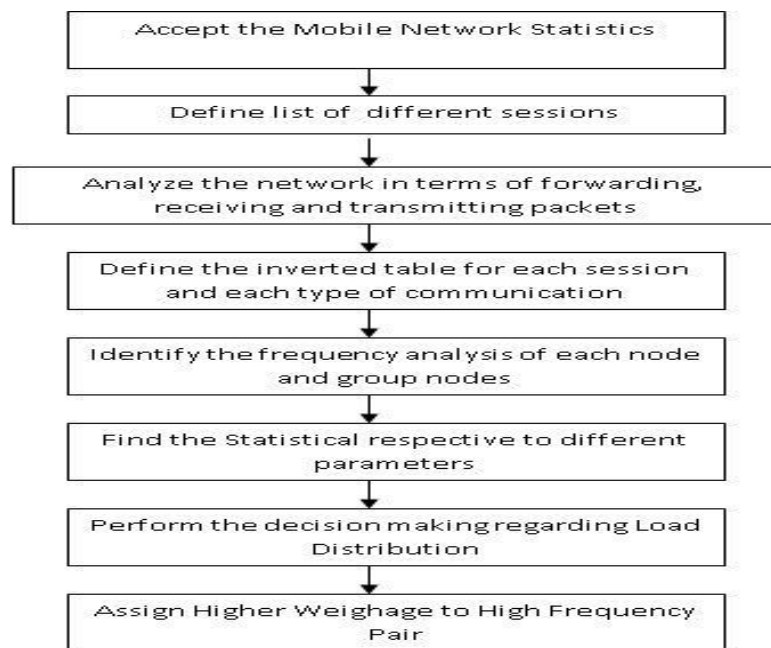
### 3.1 Significance of Work

The presented work is to find the frequent communicating nodes over the network The proposed system also independent to the network type and can be implemented on a wired or wireless network.. It is the intelligent system that uses the artificial intelligent system approach along with statistical analysis to derive the fair and quick results about the study of allocation of resources to the available nodes.

### 3.2 Research Design

The proposed work is about to find the most frequent moving pattern over the network so that we can find the nodes or the nodes pair that should get the maximum resource allocation. It means the node participating regularly over the network should get more resources. Here the term resource defines the time slice or the bandwidth of the network. In this work the main concern is about to find the frequency of node participation over the network using inverted table node analysis. The method is introduced by K.V.S.R.P.Varma in year 2010. This approach is used by him to identify the similarity and frequency analysis in case of DNA sequencing. He performed the work to find the largest possible node sequence over the network.

The complete Research Design is given as:



## IV. SIMULATION AND RESULTS

### 4.1 Simulator Study– The Network Simulator (NS2)

The simulator software that this research work used to simulate the various Ad-hoc routing protocols is the Network Simulator version 2(NS-2).

NS-2 is the most recent version of network simulator . The simulator was originally developed by the University of California at Berkeley and VINT project the simulator was recently extended to provide simulation support for ad hoc network by Carnegie Mellon University (CMU Monarch Project homepage, 1999).

NS is a discrete event network simulator where the timing of events is maintained by a scheduler and able to simulate various types of network such as LAN and WPAN according to the programming scripts written by the user. It provides substantial support for simulation of TCP, routing and multicast protocols over wired and wireless networks. It consists of two simulation tools. The network simulator (ns) contains all commonly used IP protocols. The network animator (NAM) is graphical software which is used to visualize the simulations. NS2 fully simulates a layered network from the physical radio transmission channel to high-level applications.

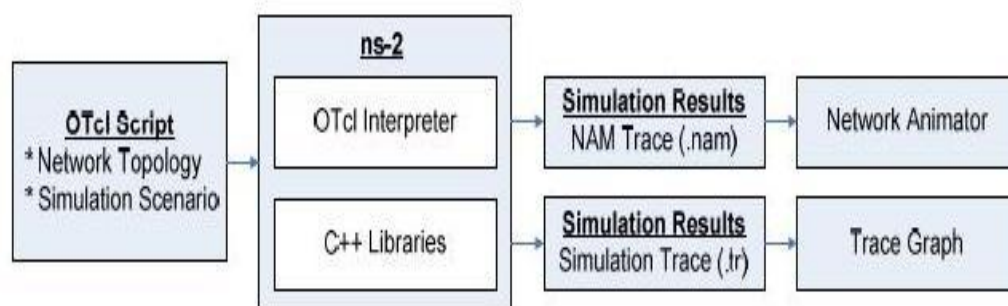
NS2 is an object-oriented simulator written in C++ and OTcl (an object oriented extension of Tcl). The simulator supports a class hierarchy in C++ and a similar class hierarchy within the OTcl interpreter. There is a one-to-one

correspondence between a class in the interpreted hierarchy and one in the compile hierarchy. The reason to use two different programming languages is that OTcl is suitable for the programs and configurations that demand frequent and fast change while C++ is suitable for the programs that have high demand in speed. NS2 is highly extensible. It not only supports most commonly used IP protocols but also allows the users to extend or implement their own protocols. The full source code of NS2 can be downloaded and compiled for multiple platforms such as UNIX, Windows etc.

The ns-2 simulator has several features that make it suitable for our simulations:-

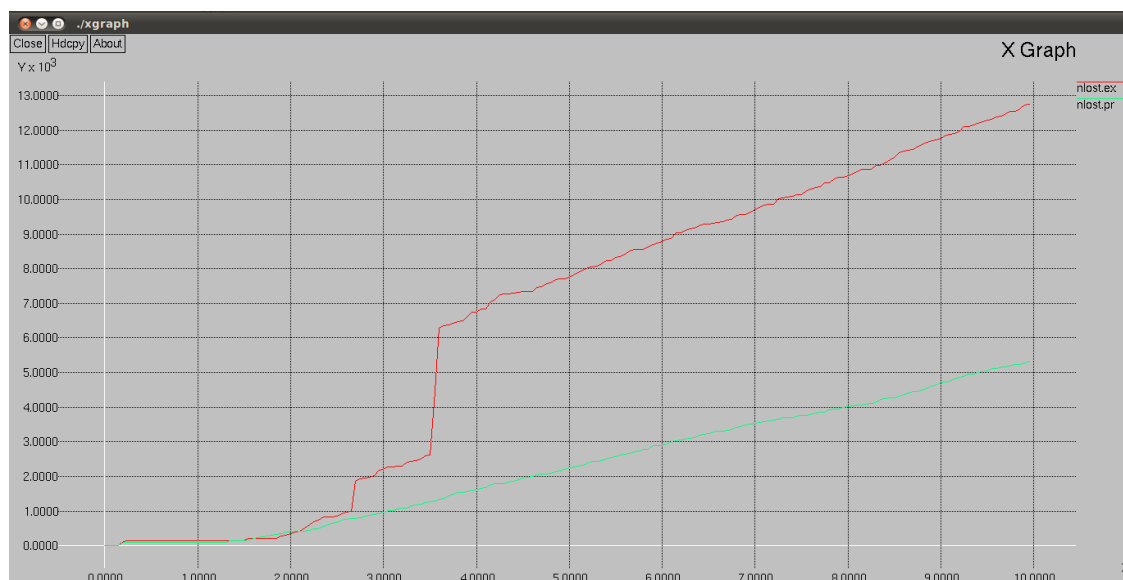
- A network environment for ad-hoc networks,
- Wireless channel modules (e.g.802.11),
- Routing along multiple paths,
- Mobile hosts for wireless cellular networks.

When the simulation is finished, the simulation results are produced in one or more text-based output files that contain detailed simulation data, which can be used to analyze directly or can be used in the graphical user interface Network Animator (NAM) . This graphical user interface shows the simulation result in an easy way.



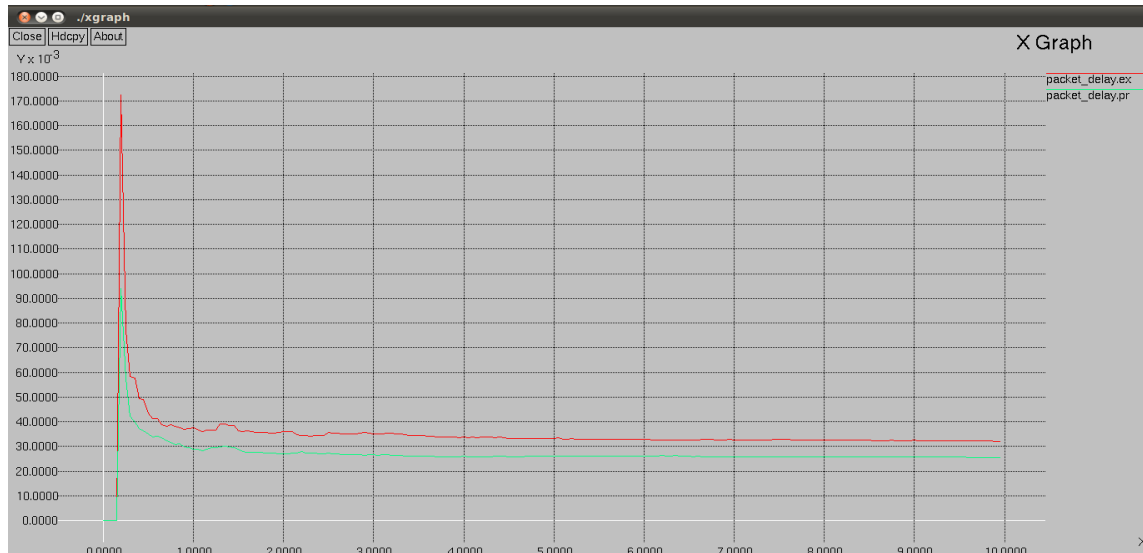
**Figure 4.1: NS-2 Architecture**

#### 4.2. Analysis Results



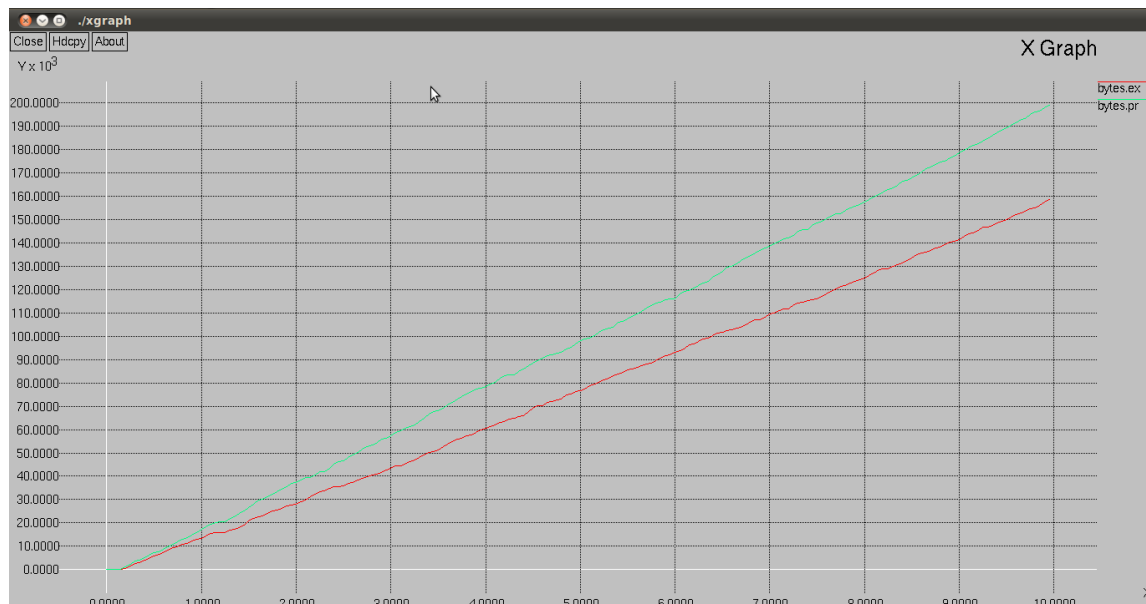
**Figure 4.2.1: Packet Lost (Existing Vs Proposed Approach)**

Here figure 4.2.1 is showing the comparative analysis of packet lost over the network. Here x axis represents the time and y axis represents the packet transmitted. As we can see after implementing the proposed approach the packet loss over the network is decreased.



**Figure 4.2.2: Packet Delay (Existing Vs Proposed Approach)**

Here figure 4.2.2 is showing the comparative analysis of Packet Delay over the network. Here x axis represents the time and y axis represents the Packet Delay of communication. As we can see after implementing the proposed approach the Packet Delay over the network is decreased.



**Figure 4.2.3: Bytes transmitted (Existing Vs Proposed Approach)**

Here figure 4.2.3 is showing the comparative analysis of bytes transmitted over the network. Here x axis represents the time and y axis represents the bytes transmitted. As we can see after implementing the proposed approach the bytes transmitted over the network is increased.

## V. CONCLUSION

The proposed work is about the prevention of Selfish Node attack and to improve the DSR protocol in terms of security. The system is implemented in a wireless network with DSR protocol. As in case of multicast network because of lot of communication, the network suffer from some attack that results the packet loss over the network. The proposed work is about to minimize this packet loss over the network. The work will increase the throughput with this improved DSR protocol. In this system an improved inverted list approach is defined to perform the analysis among neighboring nodes and to provide the communication from effective path. The implementation is performed in ns2 and analysis is presented using xgraph.

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