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Improving the Performance of Reactive Routing Protocol in Mobile Ad-hoc Network

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ABSTRACT

The management of ADHOC network is great challenge due to dynamic infrastructure and mobility of node. Due to mobility of node routing path of network and security of communication suffered. In the process of node mobility and path discovery of routing protocol take huge amount of power and decrease the life of network. For the improvement of power and secured communication various protocol are designed but all are limitation in terms of group communication in ADHOC network. In this paper modified the Dynamic source Routing protocol for the stability and improve the performance of ad-hoc network. Our proposed modified scheme dynamic source routing protocol simulate in network simulator-2 tool. In simulation process we used 10, 20, 30 and 50 nodes.

Keywords: Mobile Ad-hoc Networks, Network Layer, Application layer, Network simulator, Throughput, End to end delay, Packet delivery ratio.

INTRODUCTION

Mobile Ad Hoc Network (MANET) is a collection of wireless mobile nodes that dynamically communicate amongst themselves without the use of any existing infrastructure and centralized/decentralized administration. The mobile nodes must cooperate at the routing level in order to forward packets to from source to the destination. Current ad hoc routing protocols such as Dynamic Source Routing (DSR) [1] assumes the network is benign and cannot cope with misbehaviour, i.e., a misbehaved node may drop packet silently to save battery power, etc [3].

Mobile Ad-hoc Networks (MANETs) allow nodes to communicate each other in mobility. These networks are useful in many environments where the infrastructure is not available and cannot be installed. Two of the major issues of these networks concern the security of data exchanged and the energy consumption, and they are in contrast because to achieve a better security, more operations and data exchanges are needed, therefore more energy is consumed. On the security side, many proposals use encryption to avoid attacks from malicious nodes external to the network [2].

A mobile ad hoc network (MANET) is a communications network that can be defined as a collection of independent, dynamic, wireless and mobile nodes that can be established without the help of any pre-existing infrastructure. As every

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node in a MANET is a wireless node, it has a limited transmission range, and hence cannot communicate with all the other nodes in the network directly. This has lead MANET to be a multi hop network. Every node in a MANET moves randomly in and out of it and hence the topology of this network changes dynamically. This feature of MANETs also results in frequent changes in the location of the mobile nodes which makes routing task more complicated. As the nodes are mobile, and hence there is no continuous power supply, the transmission power of the nodes is limited. As MANET is an infrastructure less and easily reconfigurable network, deployment is very easy and installation costs are very low, which has led to its wide range of application areas. MANETs have applications in many emergency and rescue situations like military, earthquakes, floods, war zones, medical and industrial fields, corporate offices, and relief operation areas for disaster management, personal and home networks [4].

In general two types of communications can be considered in classical MANETs, broadcast communications and multi hop communications via routing protocols [15]. Due to the rapid and growing expansion of the mobile ad hoc network, it has many typical applications such emergency services, education, entertainment…etc. In spite of all this characteristics of the MANET, it faces some challenges the most significant of which are limited bandwidth, routing overhead, quality of service and security. There are many routing protocols proposed for MANET, which can be classified into three main categories: Proactive, Reactive and Hybrid. Proactive routing protocols attempt to maintain consistent, up-to-date routing information from each node to every other node in the network, whereas Reactive routing protocols create just routes in case there is a desire to send information by the source node. Once a route has been established, it is maintained by a route maintenance procedure. Hybrid routing protocols has the advantage of combining both proactive and reactive routing protocols and overcome their shortcomings.

The rest of this paper is organized as follows in the first section we describe an introduction of about the mobile ad-hoc network and their types. In section II we discuss about the routing protocol, In section III we discuss about the comparative performance analysis in mobile ad-hoc network, finally in section IV we conclude and discuss the future scope.

II ROUTING PROTOCOL

These protocols can be divided into three classes‟ proactive class, reactive class and hybrid class as shown in figure 3.2.This classification of routing protocols are work according to their technique such as hop count, link state and QoS in route discovery. Hop count method, each node contains next hop information in its routing table, to the destination. While link state routing protocols keep a routing table for absolute topology, which is built up by finding shortest path of link costs. QoS routing is the procedure of selecting the path to be used by the packets of a flow, based on its QoS requirements e.g. bandwidth, delay etc [4].

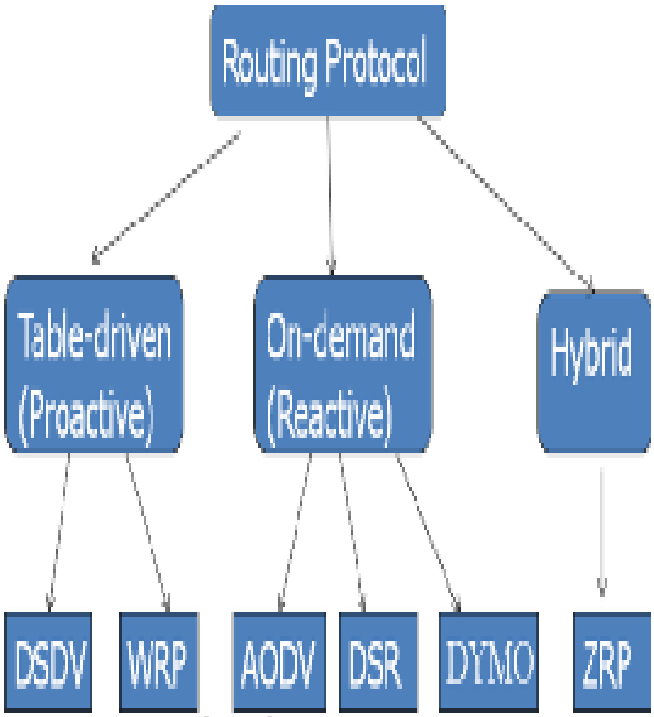

Fig 1: Routing Algorithm in MANET.

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III PROPOSED METHOD AND RESULT

In this section we describe the proposed methods and the comparative result performance analysis for the routing protocol in mobile ad-hoc network. Mobile ad-hoc network is basically collection of nodes, the routing between the nodes id done using various routing protocols. The purpose behind combining both principles together is to search for the shortest path and similarly to maintain source route to random destination in the Mobile ad hoc network. The optimization is done on Dynamic Source Routing (DSR) protocols using Distributed (DSR) algorithm.

Dynamic Source Routing protocol permits sources to find out paths to any destination. Before arriving at desired destination, all data packets of source include an entire list of nodes, which the packets must go through. Therefore, all nodes that advanced or listen in these packets may collect routing info for further use. In addition to assist rapid network topology transforms, DSR protocol also provide asymmetric links and on demand route conservation; hence no regular update packets are required for topology changes. Upon link failures, merely nodes that advanced packets through failed links must have accurate advertisements for routing. Furthermore, DSR permits sources to obtain and reserve more than one path to a specific destination in a cache. When a link failure is informed midway nodes have the chance to choose another cached route.

The demerits of DSR are it doesn't support multicasting and doesn't save energy. The data packet header of DSR contain all the intermediate node address, source and destination address and thereby decreasing the throughput. In DSR, there exist multiple routes from source to destination node because the destination node responds route reply packet via all routes. At the same time the routing packet increases the load of the network. So the routing increases packet storm.

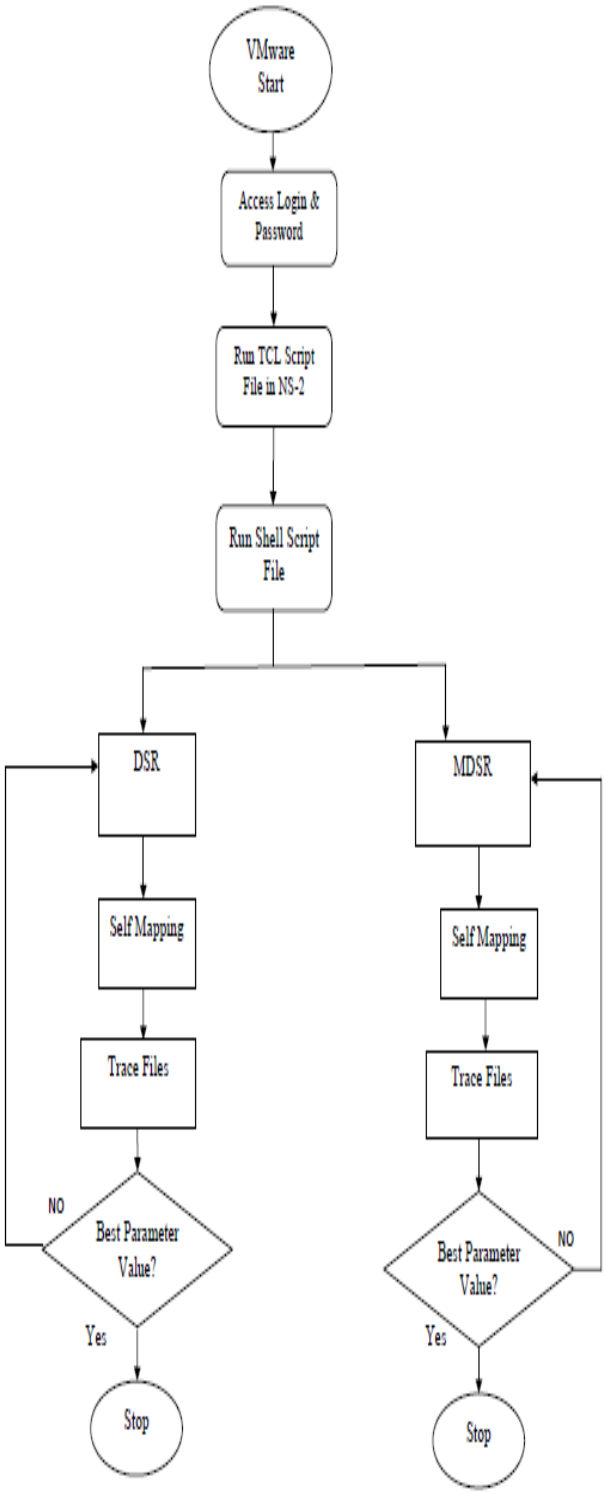

Fig 2: Proposed model of NDSR protocol.

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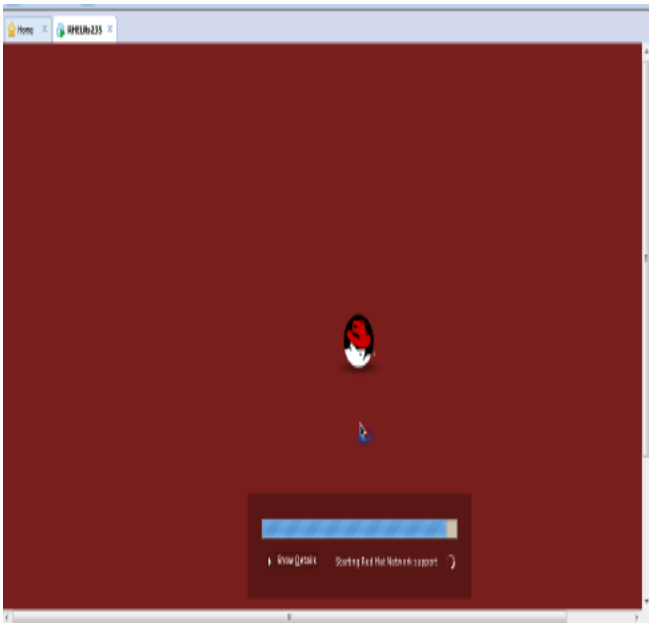

Fig 3: This window shows the progress of upload the red hat enterprise Linux.

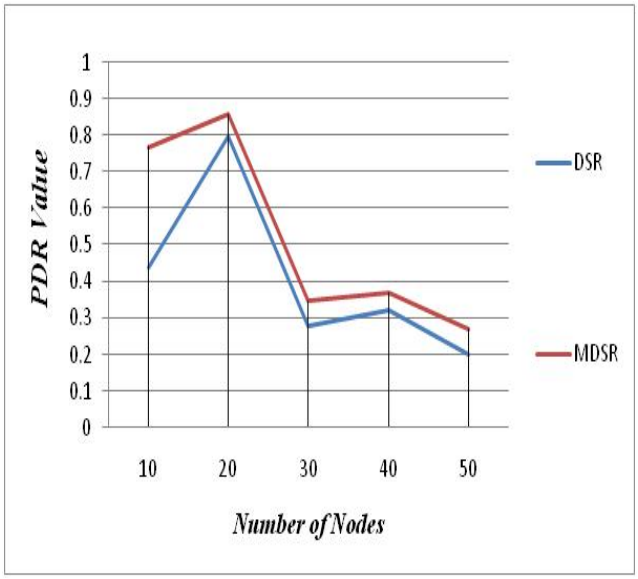

Fig 4: these graph shows that the comparative performance evaluation for the existing DSR and proposed MDSR methods with the performance parameter is Packet delivery ratio and our proposed methods shows better results than existing methods.

IV CONCLUSIONS AND FUTURE SCOPE

In the recent years, Computers and Information Technology has become an emerging field and is growing day by day. In spite of the efforts put forth towards finding secure computing environments, there are lot of threats left unaddressed on the security, integrity and privacy of the data exchanged in communications. A mobile ad hoc network (MANET) is a communications network that can be defined as a collection of independent, dynamic, wireless and mobile nodes that can be established without the help of any pre-existing infrastructure.

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