

**A SECURE SPEED AWARE ROUTING PROTOCOL IN MOBILE AD-HOC
NETWORK**Sonia¹, Mr. Vinod Saroha²¹M.Tech Student, Bhagat Phool Singh Mahila Vishwavidyalaya Khanpur Kalan, Sonipat, CSE Department, India²Assistant Professor, Bhagat Phool Singh Mahila Vishwavidyalaya Khanpur Kalan, Sonipat, CSE Department, India

Abstract--- Wireless networks give the idea of distributed architecture so that the contribution of information as well as resources can be done efficiently. In last few years, different type of adhoc networks came into the existence. With the advancement of internet and the development of personal computers, the usage of mobile computers is been increased very quick. There are different means of performing the communication over the network. This all results an efficient sharing of information and resources. While performing the communication in such network there is the needs of more effective information sharing techniques. A mobile adhoc network is responsible to perform the communication among the mobile devices without setting up any dedicated or static infrastructure. The work includes the specification of dedicated routers and other communication devices without the inclusion of cables. It is actually explained as the autonomous communication system in which wireless links are connected in the form of arbitrary graph. Such typee of networks can be established in the form stand alone acquired fashion and provide the effective communication over the network. The detection of a secure path becomes more crucial when the nodes are moving. In this present work, a new secure protocol called SMAODV will be designed that will provide the SARP protocol. This protocol is the extension of AODV that perform the secure transmission over mobile nodes.

Keywords- MANET, Proactive and Reactive Routing protocol, AODV, Network Model, Cost Model

“I. INTRODUCTION”

A Mobile Network is one of the most busy and the public network, Because of this the network suffers from the problems of different kind of attacks. In such attacks some malicious nodes are present that falsely claim itself as a valid node. It will accept the information and will not forward the information to next nodes. To handle these attacks we have presented an attack avoidance scheme. In which a preventive path will be discovered in which not attacker node will be covered secure route over the mobile network. The presented work is the improvement over the existing. The detection of a secure path becomes more crucial when the nodes are moving. In this present work, a new secure protocol called SMAODV will be designed that will provide the SARP protocol. This protocol is the extension of AODV that perform the secure transmission over mobile nodes. To identify the node velocity, a request is sent at two time instances and based on it the velocity is estimated. But in this present work, the improvement over the node formation is done by defining the node speed and the expected direction with radial specification. Now when the route will be form, a parametric estimation will be performed. The parameters considered to identify next safer hop will be the distance, speed, direction, packet loss rate and the delay analysis. Based on these parameters an effective route will be composed. The work will be implemented in NS2 and the result analysis will be driven based on throughput and the loss analysis. Considering the special properties of MANET, when thinking about any routing protocol, generally the following properties are expected, though all of these might not be possible to incorporate in a single solution

- A routing protocol for MANET should be distributed in manner in order to enhance its reliability.
- The routing protocol should be power-effective.
- The routing protocol should think about its security.
- A routing protocol should be aware of Quality of Service (QoS).

Characteristics of Mobile Networks

The main vector that differentiates a mobile network with any other network type is the used communicating devices called mobile devices. The mobility is the main feature of such networks. Due to the mobility, the special feature points considered here is the design solution of such kind of network. The issues associated and the characteristics difference between fixed networks and MANETS is the mobile nature of the nodes. The characteristics associated with the work are listed as under

A. Network Size

The size of a network is defined in terms of network area as well as in the form of network nodes. To coordinate the network under distributed control mechanism, these two vectors are considered. A Mobile network can perform a long distance communication upto LOS by using the multihop communication. Because of this the network is applicable for huge areas such as forest etc.

B. Connectivity

The connectivity is defined in the form of link selection for the next node. To identify the neighbor of a node, the coverage range analysis is done over the nodes. The nodes that come under the coverage area are considered as the connectivity nodes. The bidirectional communication is performed with these networks. The local interference is the factor while considering the connection problem.

C. Networks Topology

Actually, the mobile networks are not dependent on the topology and can provide the output in any topology free networks. The nodes can be placed at random positions in such networks. But in some specific conditions such as in classroom sessions the topology can be setup so that effective throughput will be drawn from the network. The network also subjective to the connectivity type respective to the topology such as centralized connective system or random positioned network are basic types of such topological architecture.

D. Bandwidth Constrained Links:

Wireless links are defined with lower capacity analysis under the hardwired connections. They are defined under the radio signal so that the long distance communication is possible. The channel bandwidth depends on the signal propagation. This connection can be defined under the bandwidth capacity. While performing the communication the factors included are the link quality analysis and the bit error rate.

E. Energy Constrained Operation

A mobile network requires some energy to start the communication. To provide this energy, the batteries are attached with mobile devices. The battery backup is the major factor to perform the communication when the mobile device is away from the energy source. As some operation is performed on this mobile device some amount of energy is lost. In the rescue systems, the energy vector is the critical so that more energy backup devices are taken to provide reliable communication.

F. Security

In a mobile adhoc network, the nodes are shared and the information travels among multiple nodes before the final delivery. In such case, it is required for communication to maintain the security so that no intermediate node or any external node capture the communication information. Such kind of network also suffer from different kind of security threats such as DOS attack. As of the public network, mobile network suffer high security risks and having the problem of stolen information and heavy traffic that gives the insecure wireless link over the network.

G. Autonomous

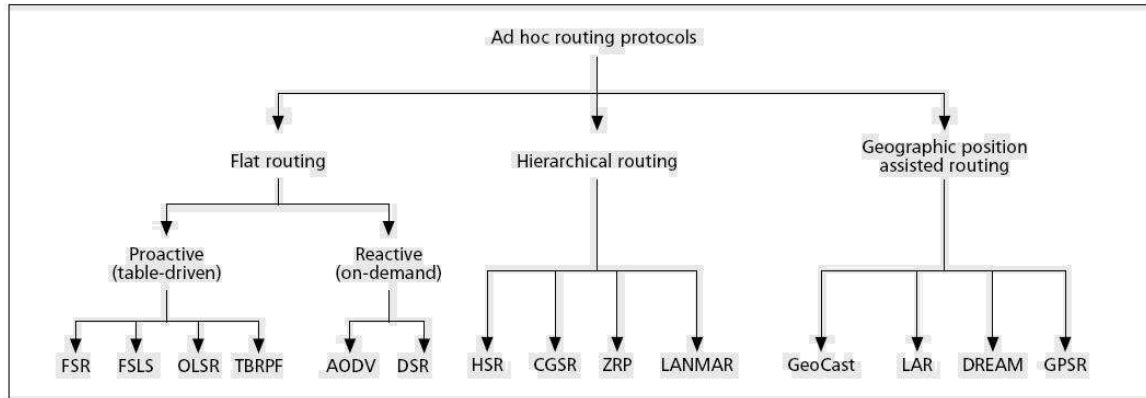
Another property of the mobile networks is the communication without any centralized administration. The communication over such network is performed by the host and later on controlled by the routers. To perform the distance communication in hybrid networks, the switches and other cross link devices can be used.

H. Distributed Operation

These kind of networks does not having any centralized control to perform the network operations. The network is distributed among the terminals. The nodes includes in the network collaborate so that each node can participate over the network and it is able to achieve the secure routing over the network.

“II. CLASSIFICATION OF ROUTING PROTOCOLS IN MOBILE AD HOC NETWORK”

Classification of routing protocols in mobile ad hoc network can be done in many ways, but most of these are done depending on routing strategy and network structure. The routing protocols can be categorized as flat routing, hierarchical routing and geographic position assisted routing while depending on the network structure.



Flat Routing Protocols

Flat routing protocols are divided mainly into two classes; the first one is proactive routing (table driven) protocols and other is reactive (on-demand) routing protocols. One thing is general for both protocol classes is that every node participating in routing play an equal role. They have further been classified after their design principles; proactive routing is mostly based on LS (link-state) while on-demand routing is based on DV (distance-vector).

I. Pro-Active / Table Driven routing Protocols

Proactive MANET protocols are also called as table-driven protocols and will actively determine the layout of the network. Through a regular exchange of network topology packets between the nodes of the network, at every single node an absolute picture of the network is maintained. There is hence minimal delay in determining the route to be taken.

II. Reactive (On Demand) protocols

Portable nodes- Notebooks, palmtops or even mobile phones usually compose wireless ad-hoc networks. This portability also brings a significant issue of mobility. This is a key issue in ad-hoc networks. The mobility of the nodes causes the topology of the network to change constantly. Keeping track of this topology is not an easy task, and too many resources may be consumed in signaling. Reactive routing protocols were intended for these types of environments.

Ad hoc On Demand Distance Vector Routing (AODV)

Ad hoc On-Demand Distance Vector (AODV) routing is a routing protocol for mobile ad hoc networks and other wireless ad-hoc networks. It is jointly developed in Nokia Research Centre of University of California, Santa Barbara and University of Cincinnati by C. Perkins and S. Das. It is an on-demand and distance-vector routing protocol, meaning that a route is established by AODV from a destination only on demand. AODV is capable of both unicast and multicast routing. It keeps these routes as long as they are desirable by the sources. Additionally, AODV creates trees which connect multicast group members. The trees are composed of the group members and the nodes needed to connect the members. The sequence numbers are used by AODV to ensure the freshness of routes. It is loop-free, self-starting, and scales to large numbers of mobile nodes. AODV defines three types of control messages for route maintenance:

“III. OTHER RECENT WORKS IN MANET”

Xiao Yang Zhang performed a work, " Proposal of a Method to Detect Black Hole Attack in MANET". Author propose a new detection method based on checking the sequence number in the Route Reply message by making use of a new message originated by the destination node and also by monitoring the messages relayed by the intermediate nodes in the route.

In Year 2012, Monita Wahengbam performed a work, " Intrusion Detection in MANET using Fuzzy Logic". In this paper, Author analyze some security attacks of MANET and Author propose to identify the attack by using an Intrusion Detection System (IDS).

In Year 2007, Satoshi Kurosawa performed a work, " Detecting Blackhole Attack on AODV-based Mobile Ad Hoc Networks by Dynamic Learning Method". This paper analyzes the blackhole attack which is one of the possible attacks in ad hoc networks

In Year 2011, Rajib Das performed a work, " Security Measures for Black Hole Attack in MANET: An Approach". In this paper, Author give an algorithmic approach to focus on analyzing and improving the security of AODV, which is one of the popular routing protocols for MANET. Presented aim is on ensuring the security against Black hole attack.

In Year 2012, Saurbh Goyal performed a work, " An Improved Inverted table Approach to Detect Selfish Node In Mobile Ad Hoc Network". Author have to find the frequency of different node and group nodes over the network.

In Year 2010, Athira.M.Nambiar performed a work, " Wireless Intrusion Detection Based on Different Clustering Approaches". In this paper, Author are finding optimal set of features from collected WLAN data using a Ranking Algorithm technique.

In Year 2012, Guanhua Yan performed a work, " Towards a Bayesian Network Game Framework for Evaluating DDoS Attacks and Defense". Author conduct a variety of experiments to evaluate DDoS attack and defense scenarios where one or more layers of defense mechanisms are deployed, and demonstrate that Presented framework sheds light on the interplay between decision makings of both the attacker and the defender, as well as how they affect the outcomes of DDoS attack and defense games.

"IV.CONCLUSION"

A mobile network is one of the most busy and required public area network. In most of the real time scenes are communicated under the mobile network. In this present work, the mobile communication in some such network scenarios is been discussed and simulated. The work is here been performed to improve the existing algorithm with the with speed specification. The work is about to generate the speed adaptive communication path so that reliable communication will be drawn over the network. The work is here been implemented in NS2 environment. The analysis of work is done under different parameters such as packet transmission, lossrate, communication rate and communication delay. The results shows that the presented work has improved the communication rate and reduce the communication loss over the network.

The presented work is about to design a new secure routing protocol in case of mobility node network. While performing the communication over the mobile network, it is required to estimate the node mobility. To perform this estimation, the velocity estimation of a node is required. To estimate the velocity, the communication response analysis is performed at two different time instances. The difference in the speed and position will identify the directional movement of the node. But because of this communication delay is increases.

In this work, the protocol level change is defined. To perform this the basic architecture of node will be modified with the inclusion of direction and speed parameters. Now when the communication will be performed, the updation to these parameters will be done. Once the speed estimation is performed, the next work is to identify the safe path over the network based on the direction and the communication parameters. The parameters considered in this work are speed, direction, lossrate and delay.

"V.FUTURE WORK"

In this present work we have analyzed different kind of random scenarios under different parameters under AODV protocol. Here we have find the limitation of protocol respective to the environment. In future, enhancements can be done in following ways

- The work is here tested random scenarios, in future some other real time scenarios can also be implemented.
- Here the work is tested under the scalability vector, in future some other vector can also be considered.
- In this work, the mobile network is considered. In future, PAN or the sensor area network can be considered

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