International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 04 Issue: 04 | Apr -2017 www.irjet.net p-ISSN: 2395-0072

AN OPTIMISTIC APPROACH OF MARK MECHANISM WITH ASEER PROTOCOL FOR SECURE ENERGY EFFICIENT ROUTING IN MOBILE AD HOC NETWORK

Ms.S.Nithya[1], Ms.S.Deepika.A.S[2], Ms. Divya Pradeepa.S[3], Ms.Jeffrin.D[4], Ms.Gayathri.P[5]

[1]Asst.Prof, Dept of ECE, KPRIET, Coimbatore, Tamil Nadu, India.
[2,3,4,5]Student, Dept of ECE, KPRIET, Coimbatore, Tamil Nadu, India.

Abstract - *In current scenario, MANET plays a major role due to its unique characteristics. MANET is an infrastructure less network, where it can send the information through the intermediate nodes.MANET's are suitable for military applications, natural disasters and many emergency situations. MANET's having the problems like slow data rate, difficult to maintain the link if the mobility is high and as well in MANET security is missing. This paper aims at proposing a new MARK mechanism along with a new protocol called ASEER, for the purpose of efficient transmission of the data with high level of security. This paper also aims at analysing the performance of the proposed ASEER protocol.*

Key Words: **ASEER, MARK Mechanism MANET, Performance, Security.**

1. INTRODUCTION

MANET terms Mobile Ad hoc Network, is a self-organizing network with no fixed infrastructure. MANET which does not rely on any central administration. To sustain in a network, each nodes in a network may act as a router and as well it can also act as a source and the destination based on the requirement. Due to dynamic topology of the MANET, causes many problems such as loss of packets, delay, and link failure and so on. As the nodes in the network be a mobile one, so that it may easily be entering and leaving the network, so that the topology of the node may continuously change the topology of MANET.

1.1 MANET Application

MANET is in use in various real time fields such as military field applications, civilian applications (i.e. money transfer and Ad hoc classrooms). All the MANET nodes are easily placed in cars, air planes, ambulance, and call taxi or in any such small electronic device. These nodes form a topology and they can connect each other.

1.2 MANET protocols

In MANET, protocol plays a major role in routing the information from one node to another (i.e. from source to destination)

MANET protocols can be classified into three categories:

1. Reactive protocol
2. Proactive protocol
3. Hybrid protocol

Reactive protocols

Reactive protocol routing is based on query-reply dialog .In this methodology the routes are established only when the need arises. They do not need periodic transmission of data over a network.

Proactive protocol

They are the protocols which continuously get the details of the topology of the network by exchanging the information about the topology among the network nodes. The cost for maintaining the topology is very costly, whenever the network topology changes too frequently.

Hybrid protocol

Hybrid routing protocols is a mixture yield of proactive and reactive protocols.

1.3. Security attacks

In the case of pure Ad hoc networks, trust management becomes very complicated by the other nodes in the MANET. The security attacks may be internal attacks or external attacks.

Internal attacks

Internal attacks are due to internal nodes in the specific topology in MANET.

External attacks

External attacks are due to outsiders fraudulent activities are done by one or more colliding nodes that work together.

This paper aims on energy efficiency and security of MANET.

2. LITERATURE SURVEY

A lot of related works has been done on energy efficiency and the security in MANET .Recent researches have concentrated more on lifetime of the network.

Authors of paper [1] proposed that the lifetime of the lifetime of the network is increased by enhancing the Dijkshtra's algorithm and by using the efficient AODV routing protocol. In this paper, the author suggests that, the enhanced protocol finds the optimal path between the source and the destination and thereby the energy consumption by the nodes is drastically decreased.

Authors of paper [2] proposed the new protocol namely energy efficient routing protocol, which may minimize the consumption of energy by the nodes in the network and to enhance the lifetime of the network.

Author of paper [3] proposed energy efficient routing protocol to reduce the energy consumed by the individual node in MANET. Here, for finding the energy efficient path, the consumption of residual energy and the transmission power of the node is calculated.

Author of paper [4] proposed OCER protocol. OCER means optimized energy aware routing. It considers the packet buffering time in the node and as well it considers the energy of the node while selecting the route. It follows the operation which is similar to reactive protocol.

Author of paper [5] proposed EPAR routing protocol, to maximize the Ad hoc network lifetime and as well it reduces the traffic between the nodes that prevents the energy usage.

Author of paper [6] proposed a protocol namely SMT secure message transmission which safeguards the transmission of data in MANET from attackers (i.e. from malicious behavior of the other nodes. This methodology concentrates only on security.

Author of paper [7] concentrated on secure routing of information in mobile Ad hoc network. They proposed protocol that protects AODV using sequential aggregate signature (SAS) based on RSA. In this method session key is generated for each pair of source-destination in the network.

Author of paper [8] proposed a new algorithm which accessing the important data transmitted in the MANET, can be restricted by the unauthorized users. This approach can be used by the users with minimal cost and thereby avoiding all possible attacks.

3. PROPOSED METHODOLOGY

In this paper a new protocol called ASEER protocol is proposed. ASEER stands for adaptive secure energy efficient routing protocol. The methodology of this protocol is split into two mechanisms. The first mechanism deals with the energy consumption of the nodes in the MANET. In MANET, the nodes are mobile and they rely on batteries .If the node losses its battery it then leads to link breakage (or) link failure. Due to this drawback, the more number of packet loss will take place; therefore it will affect the throughput of the system.

Here, the proposed protocol, overcomes all these drawbacks in an effective manner. The second methodology deals with high level security in MANET.

METHODOLOGY 1: Energy efficiency –mark mechanism

The first methodology deals with energy efficiency of the system (i.e. nodes in a MANET).
MARK mechanism deals with energy utilization, where the total energy in the node is categorized into two types (i.e. active communication energy and inactive communication energy).
It initially aims for inactive energy consumption whenever the node is in unused state, (i.e. ideal node) those nodes is shifted to sleep state, whereas remaining nodes in active state. This method reduces a small amount of energy wastage.
The secondary aim is to take care of active communication energy. The active communication energy involves in the process of establishing the path, route selection of various source link pair and destination, and as well as the delivery of data package to the destination from the source.
MARK mechanism deals with the power saving during route selection between (i.e. energy) the source and the destination as well as the energy control (or) energy saving during data transmission. This can be achieved by considering residual battery capacity.

MARK MECHANISM

Mark mechanism deals with energy and lifetime of the nodes in the MANET. In this mechanism, it chooses the routing path based on the energy of the individual nodes involved in operation.

Step 1: Initially source node send request to all other nodes in the network for Battery capacity, residual battery capacity, And transmission energy range etc.,

Step 2: After the details received from the nodes, the routing path will be choosen based on the min max residual capacity and transmission energy range.

Energy efficiency –mark mechanism

The first methodology deals with energy efficiency of the system (i.e. nodes in a MANET).

MARK mechanism deals with energy utilization, where the total energy in the node is categorized into two types (i.e. active communication energy and inactive communication energy).

It initially aims for inactive energy consumption whenever the node is in unused state, (i.e. ideal node) those nodes are shifted to sleep state, whereas remaining nodes in active state. This method reduces a small amount of energy wastage.

The secondary aim is to take care of active communication energy. The active communication energy involves in the process of establishing the path, route selection of various source link pair and destination, and as well as the delivery of data package to the destination from the source.

MARK mechanism deals with the power saving during route selection between (i.e. energy) the source and the destination as well as the energy control (or) energy saving during data transmission. This can be achieved by considering residual battery capacity.

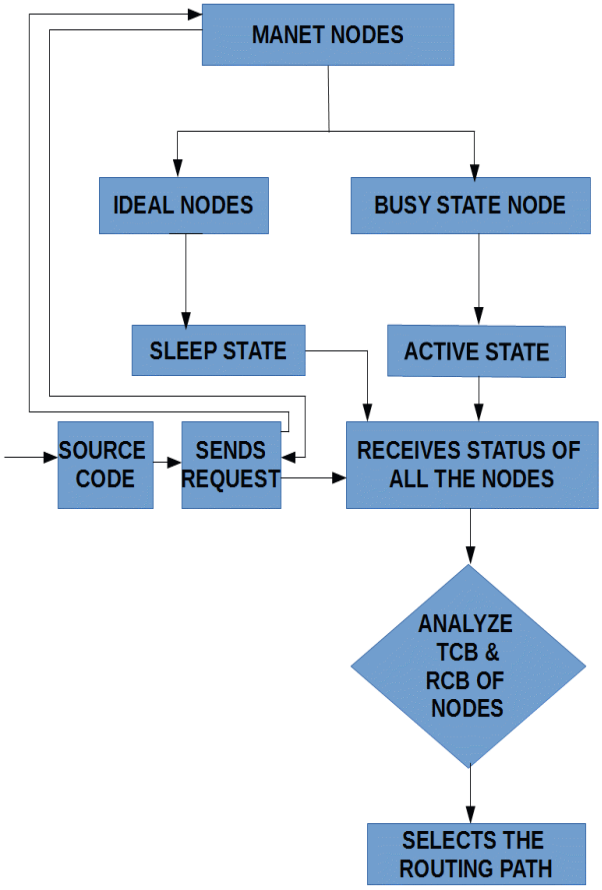

Fig -1: Flow chart of MARK Mechanism

4. ASEER PROTOCOL OPERATION

Step 1: Nodes are grouped and a cluster is formed.
Step 2: Verify all the nodes are active; if any of nodes are ideal, make them into sleep state, so that inactive communication, Energy will be reduced.

Step 3: Each node in the network are table driven(proactive) ,therefore each and every node maintains the routing information to every other node, whenever a topology is changed, the routing table information is also updated periodically.
Step 4: Once if source node is ready to transmit the data information to the destination, it sends the service request to the destination (S_{Req})
Step 5: If the destination is ready to accept it sends the ACK i.e.:(Acknowledgement) to the source ,along with the routing path identification(i.e.: information about the intermediary nodes)
Step 6: After receiving the ASK and details about the intermediary nodes , the source node sends the query message to the individual intermediary nodes stated sid(query"N_{ID}, E_n ,REC_n, TE_n, DS_n, ST_n HP_n")

N_{ID} = Node ID
E_n = Energy of the node
REC_n = Residual energy capacity of the node.
TE_n = Transmission energy of the node
DS_n = Digital signature of the node
ST_n= Status of the node (Traffic)
HP_n= Hop count of the node.

Step 7: After getting all those above information from intermediately nodes, based on all the information's received, the source node selects the efficient path for data transmission in MANET.
Step 8: After selecting the required path for data transmission, the sender sends the intermediately node details (ie: routing path) to the destination.
Step 9: After getting the details from the sender, the destination sends the ACK to the sender.
Step10: The sender creates a pair of key namely PPK1 & PPK2.PPK1 is key generated by the source. This key is transmitted between the sender, route nodes and the receiver. This key is not shared with any other nodes in the MANET. The key is transmitted between the nodes along with the digital signature of the each nodes involved in the operation.
Step 11: PPK2 is another selected key that must be transmitted only between the source & the destination.

5. RESULTS:

To validate the model, simulations were carried out in NS2.Performance of the ASEER protocol was carried out through NS2 by means of various parameters like energy consumption, payload, throughput, reliability and efficiency.In mobile Adhoc network, energy consumption and security plays a major role. Though various algorithms and protocols were proposed they were small discrepancies present.

In this paper a new methodology is proposed to transmit the data in secured manner by means of pair of protective key with less energy consumption. Thus will

transmit the data in more efficient and secured way, as we implement this type of mechanisms in military, cyber applications.

By this methodology, we can secure the data in a major level in mobile Adhoc networks. By means of analyzing various parameters, we can say that our proposed protocol performs 80% better way in mobile ad hoc networks when compared with the previous other protocols

REFERENCES:

[1].Jaspreet Singh, Kartik Sharma, "Energy efficient AODV routing protocol for mobile adhoc network", international journal of engineering & computer science ISSN: 2319-7242, vol 4, issue 9 sep 2015,page no:14529_14532.
[2].Priyanka Warwadekar , Prof Kavitha mhatre 'Improving performance of AODV with energy efficient routing in MANET".
[3].May Cho Aye, Aye Moe Aung , "Energy efficient routing for MANET's using on-demand multipath routing protocol, "International journal of advanced research in computer engineering & technology (IJARCET) volume 3,issue 5,may 2014.
[4].Seema Verma ,Rekha Agarwal , and Pinki Nayak , "An Optimized Energy Aware Routing protocol (OEAR) scheme for mobile adhoc networks. Using variable Transmission range", International journal of computer applications, vol 45, No: 12, May 2012.
[5].Yashpreet Kaur, Mandeep Kaur, "An efficient EPAR routing protocol in MANET based upon AACO", International journal of advanced research in computer science and software engineering, volume 6, issue 8, Aug 2016.
[6]..Panagiotis Papadimitratos & Zygmunt.J.Hass, "Secure data transmission in mobile adhoc networks", ACM workshop on wireless security (Wise 2003), San Diego, CA, September 19, 2003.
[7].Waleed S.Alnumay & Uttam Ghosh "Secure routing and data transmission in mobile adhoc networks" International journal of computer networks & communication (IJCNC) vol 6, No 1, Jan 2014.
[8].Ira Nath, Prosenjit Chakraborty , "Review of various attacks & a new secure data transmission mechanism for MANET, International journal of computer applications, vol 150, No 1, Sep 2016.