International Journal of Scientific Research and Modern Education (IJSRME)
ISSN (Online): 2455 – 5630
(www.rdmodernresearch.com) Volume I, Issue I, 2016

TRUST COMPUTATION METHODS IN MOBILE ADHOC NETWORK USING GLOMOSIM: A REVIEW

D. Ranjith*, J. M. Balajee & C. Kumar*****
* Assistant Professor, Department of Computer Application, MAHER (Meenakshi University), Chennai, Tamilnadu
** Research Scholar, SITE, VIT University, Vellore, Tamilnadu
*** Assistant Professor, Department of Computer Application, Shanmuga Industries Arts and Science College, Manalurpet, Tiruvannamalai, Tamilnadu

Abstract:

Mobile Ad hoc Network is a type of Ad hoc network that can change locations and configure itself. Mobile ad hoc network is infrastructure-less network of mobile devices connected without wires. In MANET host moves frequently in any direction, so that the topology of the network also changes frequently. No specific algorithm is used for routing the packets. Packets/data must be routed by intermediate nodes in high level packets to their respective destination. So, each node should forward the packets only to the trusted nodes have been proposed in it so far in MANET. To overcome the problem, a comparative study of two trust computation methods (Dempster-Shafer and Bayesian) in mobile ad hoc network is proposed. This will be done by with the help of simulators GloMoSim.

Key Words: Mobile Adhoc Network, Dempster-Shafer, Bayesian, MANET & GloMoSim

Introduction:

For the past few years there is a the huge development in technology, during those time lot of new programming languages, algorithms, operating systems, routing protocols have been introduced in the market but people are not using all those technologies. Even after getting the huge development in MANET [1] [2]. This project will helps to find the efficient trust computation approach among them. Calculating the trust value for each and every node in the Mobile Ad hoc network using mathematical model is arduous task [3]. In MANET there is no specific topology lies, with that dynamic topology routing of a packet without any loss itself is crucial one. The computational work can be done using MATLAB tool provides an easy way of application prototyping likewise new simulation tool used for optimization. [11].

Problem Definition:

In Mobile Ad hoc Network (MANET) one of the major characteristics is dynamic topology. Due to this characteristic there arises a problem in packet forwarding mechanism. MANET is infrastructure-less network, it does not have any hardware component to route the packets to respective destination. In order to forward these packets each and every node should take part in routing mechanism which helps the packet to reach the destination node. Nodes in the MANET won't forward the packet to the next node, before forwarding a packet it will consider its energy level if it has enough energy to transfer the packet and also for the survival of that particular node then only it will forward the packet to next node else it won't. Each node has to find the trusted node for transferring the packet. Trusted node will be found only by maintaining the trust table for each and every node in the network. Trust of a node will be known only with trust value. To compute the trust value lot of approaches have been proposed, but none of them are widely used. The respective destination of this packet is stored in Google and also in the Drop boxes respectively [9]. Problem is to identify the better computation approach to calculate trust.

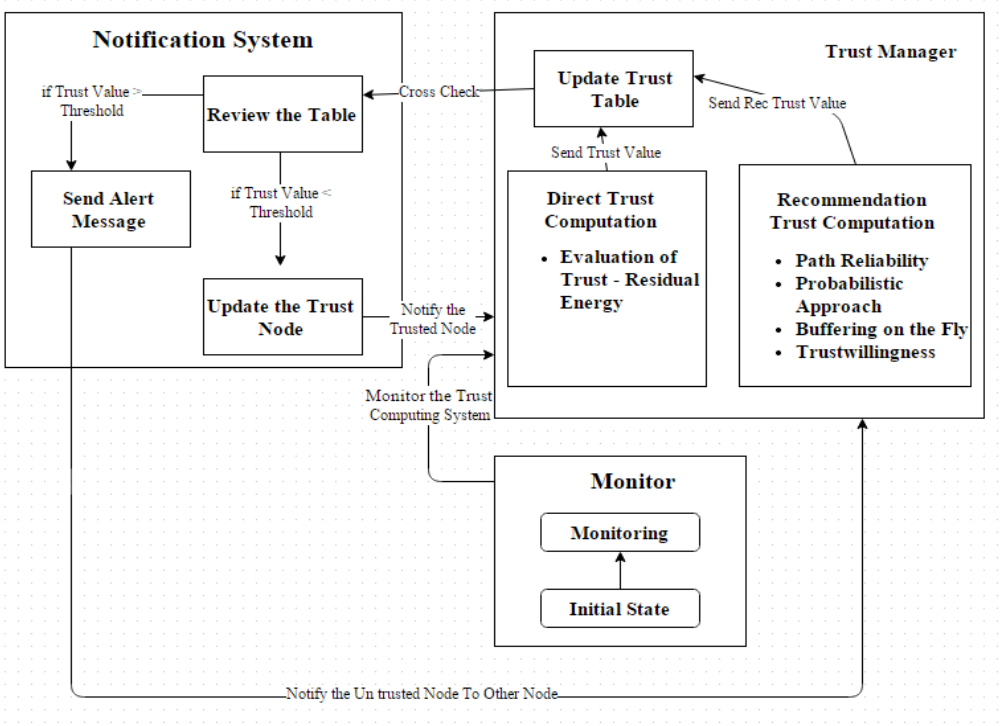

Figure 1: Overall Architecture of Nodes

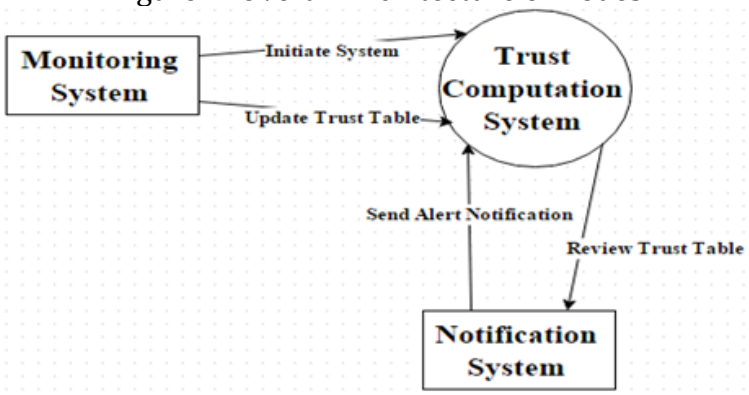

Figure 2: Computation Monitoring System

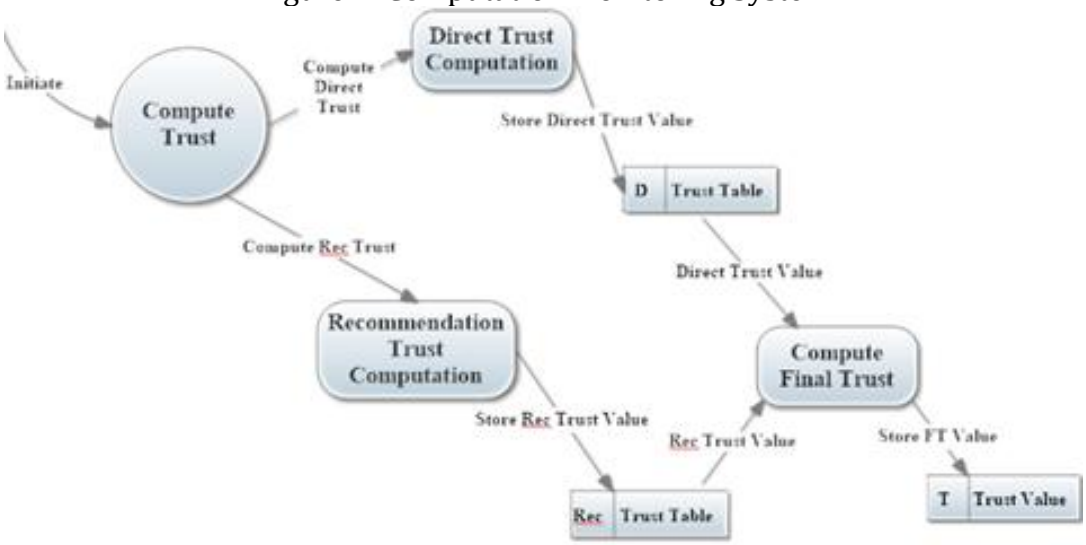

Figure 3: Trust Computation Process

Test case ID	Test Case Description	Test Input	Expected Output	Actual Output	Result
Tid_101	Nodes should be created	Create 25 nodes	25 nodes created	25 nodes created	Pass
Tid_102	Select Source and Destination node	Both source and destination selected	Display label	Label displayed	Pass
Tid_103	Nodes are mobile	Node configured correctly	All nodes are mobile	Mobile	Pass
Tid_104	Neighbour nodes are detected	Use correct protocol	Detect neighbouring nodes	Neighbouring nodes detected	Pass
Tid_201	destination receives the packet from source	Send packet	Data received at destination	Data received at destination	Pass
Tid_202	RReq have been sent	RReq Message	Received Successfully	Successfully Received	Pass

Table 1: Test cases of Each Nodes

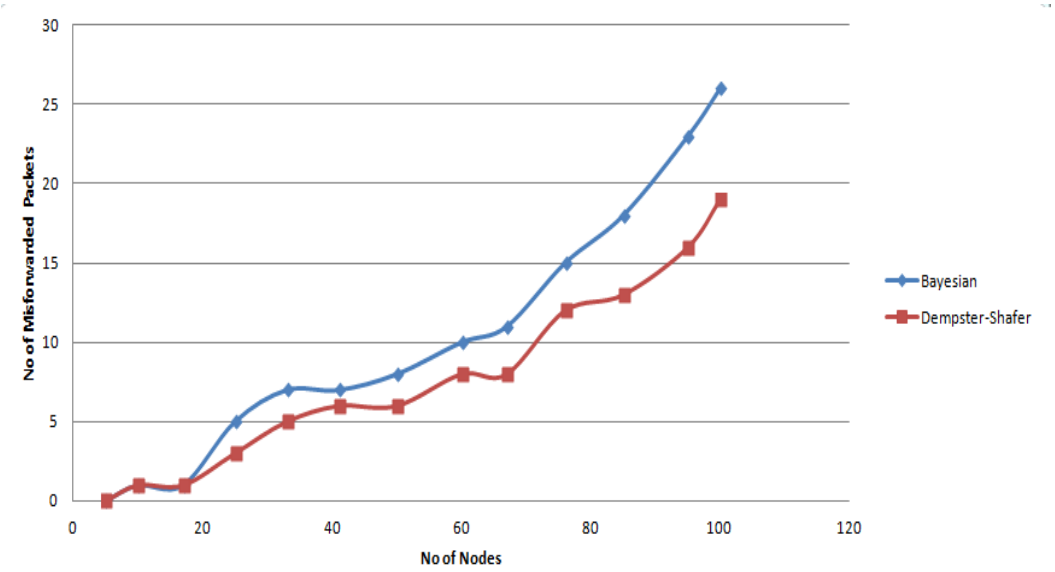

Figure 4: Comparison chart Between Dempster-Shafer and Bayesian

This is a graph showing the comparison between number of misforwarded packets and number of nodes with x-axis denoting the number of nodes and y-axis denoting the number of misforwarded packets.

Results and Discussion:

Here, the conclusion is that computing the trust value based on Dempster-Shafer better than that of Bayesian. Because Bayesian is the probabilistic approach which only maintains a single value which can be thought as an "expected" value. At the same time when a single estimate is preferable, a Bayesian approach may be simpler and more appropriate. In the case of Dempster-Shafer theory uses Dempster's Rule of Combination to incorporate new information. This can be considered a generalization of Bayes rule.

Conclusion and Future work:

This paper was done by using GloMoSim which implemented the idea of comparing the two mathematical models for trust computation in an easy-to-understand manner, and in a more effective way than usual. Here this project will thus help in the reduction of misforwarding of datagram packets to the neighbouring nodes during data transfer. This paper if enhanced in future will help in security purposes from activities like intrusion, hacking, spoofing, fishing etc. It will also help in finding malicious nodes, thus making the network more secure.

References:

1. Khalid Zaman Bijon, Md Munirul Haque and Ragib Hasan, "A TRUst based Information Sharing Model (TRUISM) in MANET in the Presence of Uncertainty". 2014 Twelfth Annual Conference on Privacy, Security and Trust (PST).
2. A.rajesh, Dr. N. Mohan kumar, "Multi-level trust architecture for mobile adhoc networks based on context-aware", Journal of Theoretical and Applied Information Technology, 20th January 2014. Vol. 59 No.2.
3. Aravindh S, Vinoth R S and Vijayan R, "A TRUST BASED APPROACH FOR DETECTION AND ISOLATION OF MALICIOUS NODES IN MANET", International Journal of Engineering and Technology (IJET), Vol 5 No 1 Feb-Mar 2013.
4. Wenjia Li, Anupam Joshi and Tim Finin, "ATM: Automated Trust Management for mobile Ad-hoc Networks Using Support Vector Machine".
5. Arvind Sharma, Dr. Neeraj Kumar, "Trust Based Theoretical Framework for Mobile Ad-Hoc Networks", International Journal of Advanced Research in Computer Science and Software Engineering. Volume 3, Issue 6, June 2013.
6. D. Johnson, D. Maltz, Y. Hu, and J. Jetcheva, "Dynamic Source Routing Protocol for mobile Ad hoc Networks", Internet Draft, Internet Engineering Task Force, Mar. 2001.
7. Jorge Nuevo, "A Comprehensible GloMoSim Tutorial", INRS – University de Quebec. March 2003.
8. D.Ranjith, J.Prabakaran,"Cloud Provider for scattered universities and library","International Journal of Advanced Computing and Communication Systems" (IJACCS), Vol-1, Issue-2, July 2014.
9. D.Ranjith, J.Ramya,"Impact Services of Dropbox and Google drive in Cloud System", International journal of Applied Engineering Research" (IJAER), Vol-9, Issue17, Nov-2014.
10. S Kamalakannan, G., Balajee, J., Srinivasa Raghavan., "Superior content-based video retrieval system according to query image", International Journal of Applied Engineering Research 10 (3), 7951-7957, 2015.
11. Rajeshwari, A., Prathna, T.C., Balajee, J., Mandal, A.B., Mukherjee."Computational approach for particle size measurement of silver nano particle from electron microscopic image", International Journal of Pharmacy and Pharmaceutical Sciences 5 (SUPPL.2), 619-623, 2013.