International Journal of Advanced Science and Technology
Vol. 29, No. 3, (2020), pp. 5835 - 5842

Likelihood based Node Fitness Evaluation Method for Data Authentication in MANET

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Abstract

Mobile nodes in ad hoc network are easily compromised by attackers. Due to the presence of attackers, the network may be overloaded which leads to least security. In this research work, Likelihood based Node Fitness Evaluation Method (LNFEM) is introduced and developed based on trust model. The trust model consists of three phases. In first phase, trust model is defined based on trust generation and computation. Node recommendation is used to produce the trust vector. In second phase, the clustered secure routing is adopted to provide seamless connectivity in the presence of attackers. In third phase, direct evaluation system is used to inter relate the direct and indirect observation. The proposed method is evaluated using network simulation tool (NS2.3). The performance metrics are throughput, data authentication ratio, data confidentiality rate, control overhead and propagation delay. From the simulation results, the proposed method achieves better performance compared to the existing methods.

Keywords Likelihood function, trust computation, trust generation, cluster, throughput, data authentication ratio, data confidentiality rate and control overhead.

1.Introduction

In this modern world, handheld devices like laptops, mobile phones and tablets are very important and play a major role in everyone's life. Mobile ad hoc network is a kind of network where it support vehicle networks very well. It is helpful in disaster management, emergency applications, earth quake and so on. MANET is a powerful platform which provides connectivity, mobility and flexibility to all devices in the world.

Security is an important concern in ad hoc networks due to weak signal strength, limited physical resources and less protection of mobile nodes. Trust can act as important role to provide the authentication of ad hoc networks. Due to bandwidth constraints, it is not at all possible the participation of all nodes in the network. Both cryptography and trust model can be combined to provide the entire security in the network.

2. Previous Work

Ankita Gupta and Abhishek Dubey [1] proposed the trust based approach to prevent black hole attack using dynamic source routing protocol. In this routing, before packet forwarding process, the entire route stability was found to prevent attackers inside the network. The secure routes were established from source to destination by deploying the trust enhanced approach. The

ISSN: 2005-4238 IJAST