Chapter 11
Security Management in Mobile Ad Hoc Networks

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ABSTRACT

A mobile ad hoc network (MANETs) is an assortment of a variety of portable nodes that are linked collectively in a greater number in a wireless medium that has no permanent infrastructure. Here, all the nodes in the node partake in acting as both router and host and is in charge for accelerating packets to other nodes. This chapter discusses the various attacks on different layers and on various security protocols. So, designing a secure routing protocol is a main challenge in MANET. As we all know, this is a mobile ad hoc network so nodes in the network dynamically establish paths among each other so it is vulnerable to different kinds of threats. So, in this case, we need secured communication among the nodes present in the network.

INTRODUCTION

MANETs is autonomous system of nodes which are portable in nature and are linked by wireless links. Each node not only acts as an end system but also has a router to forward packets. As nodes freely move around the system and they organize themselves into a network, so for this reason its structure changes frequently. So, a special kind of algorithm is needed to accommodate the changing topology. As nodes dynamically establish paths among each other its attractive to various types of attackers, so we need secured communication among each other. Dynamically the nodes in MANETs join and leave the network(M. S. Athulya and V. S. Sheeba, (2012) .

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In MANET nodes openly connect and disappear at any point of time to maintain the connection. Some of the typical applications include Military applications, emergency and rescue operations, aircrafts, wireless sensor network, medical service, commercial use and personal area network.As we know MANETs is an infra-structure less type of network which consists of mobile nodes with wireless network interfaces, so nodes dynamically establish paths among one another [1]. So due to this reason it is attractive to various types of attacks. So we need a protected communication and as a result security is an important feature. So MANETS has no clear line of defence so it is accessible to both legitimate network users and malicious attackers. So one of the main challenges is to design a robust security solution that can protect MANETs from various routing attacks. Therefore, due to such disadvantages it is a challenging field to develop secured routing security in MANETs.

RELATED WORK

Many research have been done about how to securely transmit audio data, in many research, dual safety measures by encrypting and decrypting the audio at each node in the route using stream ciphering method has been presented. Secure Multiparty Computation is discussed and how modification of data is done using optimization technique. Various security problems have been explained which are adopted in the network layer. Security issues regarding data query processing and location monitoring have been illustrated in many research articles (Rashid Sheik, Mahakal Singh Chandel and Durgesh Kumar Mishra, (2012). Security solution for the routing protocol OLSR (Optimized Link State Routing) is being proposed in some articles as shown in Table 1.

Table 1. Different kinds of Secured OLSR Protocol

S.No.	Name of the protocol	Advantages	Disadvantages
1.	OLSR-SDK (Secure Data Key)	It provides sophisticated safety measures and enhanced traffic performance.	The Packet Delivery Ratio does not get better.
2.	RA-OLSR (Radio Aware)	It provides sophisticated safety measures.	It has major impact on traffic performance.
3.	COD-OLSR()	It does not generate a major traffic load.	It cannot cancel out strict attacks.
4.	Secure traffic routing OLSR	It battles against link – spoofing attack.	It has main effect on routing performance and it does not discard aggressive attacks.
5.	Trust to secure OLSR	It has fine routing presentation in a extremely damaged environment.	It does not provide sophisticated security against compound attacks.