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Intrusion detection system for wireless mesh network using multiple support vector machine classifiers with genetic-algorithm-based feature selection

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Abstract

Security is a prime challenge in wireless mesh networks. The mesh nodes act as the backbone of a network when confronting a wide variety of attacks. An intrusion detection system provides security against these attacks by monitoring the data traffic in real time. A support vector machine for intrusion detection in wireless mesh networks is proposed in this paper. The redundant and irrelevant variables in the monitored data affect the accuracy of attack detection by the system. Hence, feature selection techniques are essential to improve the performance of the system. In this paper, a novel intrusion detection system with genetic-algorithm-based feature selection and multiple support vector machine classifiers for wireless mesh networks are proposed. The proposed system selects the informative features of each category of attacks rather than the features common to all the attacks. The proposed system is evaluated using intrusion datasets generated by simulating a wireless mesh network in Network Simulator 3 and by considering packet delivery ratio, delay, etc. as the parameters. The experimental results have demonstrated that the proposed system exhibits a high accuracy of attack detection and is suitable for intrusion detection in wireless mesh networks.

Keywords

Wireless mesh network, intrusion detection system, GA based feature selection, SVM classifier.

1. Introduction

The wireless mesh network (WMN) is a notable communication technology in recent years, which adopts multi-hop forwarding techniques for high speed data communication

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