Abstract

Mobile Ad Hoc Networking (MANET) has become a key technology in recent years because of the increased usage of wireless devices and their ability to provide temporary and instant wireless networking in situations like flooding and defense. In spite of their attractive applications, MANET poses high security problems compared to conventional wired and wireless networks due to its unique characteristics such as lack of central coordination, dynamic topology, temporary network life and wireless nature of communication. It is essential to have effective security system to provide trusted communication in MANET. Intrusion detection plays a major role in the security system of Mobile ad hoc networks. Data collected for intrusion detection system contains redundant and irrelevant features. Inclusion of these features result in poor predictions and high computational overhead. Feature selection process finds the most discriminative features that increase the detection accuracy and efficiency of the IDS. This study aims to select the important features using genetic algorithm and enhance the performance of SVM classifier. The performance of the system is validated using Network Simulator (NS2). The experimental results proved that the detection accuracy of detection with all features is 96.37%
and genetic feature selection is 98.22%. The results demonstrate that the proposed IDS effectively detect the anomalies with high detection accuracy.

References

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Intrusion Detection System for Mobile Ad Hoc Networks using Cross Layer and Machine Learning Approach

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Index Terms

Computer Science Security

Keywords

Mobile ad Hoc Networks, Intrusion Detection, Machine Learning, Genetic Algorithm, Cross-Layer design, Support Vector Machines.