The task of developing Intrusion Detection System (IDS) crucially depends on the preprocessing along with selecting important data features of it. Another crucial factor is design of efficient learning algorithm that classify normal and anomalous patterns. The objective of this research work is to propose a new and better version of the Naive Bayes classifiers that improves the accuracy of intrusion detection in IDS. The proposed classifier is also supposed to take less time as compared with the existing classifiers. To gain better accuracy and fast processing of network traffic, this study applied three standard methods of feature selection. This study tested the performance of the new proposed classifier algorithm with existing classifiers, namely Naïve bayes, J48 and REPTree thereby measuring different performance parameters using 10-fold cross validation. This study evaluates the performance of the new proposed classifier algorithm by using NSL-KDD data set. Empirical results of our study show that the proposed updated version of the Naive Bayes classifiers gives better results in terms of intrusion detection and false alarm rate.
Network Intrusion Detection with Feature Selection Techniques using Machine-Learning Algorithms

References

2. Tanya Garg and Surinder Singh Khurana IEEE International Conference on Recent Advances and Innovations in Engineering (ICRAIE-2014), May 09-11, 2014, Jaipur, India
11. Dr. Saurabh Mukherjee, Neelam Sharma, “Intrusion Detection using Naive Bayes Classifier with Feature Reduction” Published by Elsevier 2012.
12. O. Y. Al-Jarrah1, A. Siddiqi1, M. Elsalamony, P. D. Yoo1, S. Muhaiedat1, K. Kim “Machine- Learning-Based Feature Selection Techniques for Large- Scale Network Intrusion Detection” 2014 IEEE 34th International Conference on Distributed Computing Systems Workshops.
16. PAT LANGLEY, STEPHANIE SAGE," Induction of Selective Bayesian Classifiers" Institute for the Study of Learning and Expertise 2451 High Street, Palo Alto, CA 94301
25. Mark A. Hall, “Correlation-based Feature Selection for Machine Learning” This thesis is submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy at The University of Waikato. April 1999
30. Jun Li1, Lixin Ding and Bo Li “A Novel Naive Bayes Classification Algorithm Based on Particle Swarm Optimization” The Open Automation and Control Systems Journal, 2014, 6, 747-753
2008.
49. Xi-Zhao Wang, Yu-Lin He, Debby D. Wang, “Non-Naive Bayesian Classifiers for Classification Problems with Continuous Attributes” IEEE TRANSACTIONS ON CYBERNETICS 2013

Index Terms

Computer Science

Algorithms

Keywords

Machine learning; Intrusion Detection System (IDS); Naïve Bayes algorithm; Feature selection; NSL KDD data set