

Internet of Things Networks: Denial of Service Detection in Constrained Application Protocol Using Machine Learning Algorithm

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Abstract : The paper discusses the potential threat of Denial of Service (DoS) attacks in the Internet of Things (IoT) networks on constrained application protocols (CoAP). As billions of IoT devices are expected to be connected to the internet in the coming years, the security of these devices is vulnerable to attacks, disrupting their functioning. This research aims to tackle this issue by applying mixed methods of qualitative and quantitative for feature selection, extraction, and cluster algorithms to detect DoS attacks in the Constrained Application Protocol (CoAP) using the Machine Learning Algorithm (MLA). The main objective of the research is to enhance the security scheme for CoAP in the IoT environment by analyzing the nature of DoS attacks and identifying a new set of features for detecting them in the IoT network environment. The aim is to demonstrate the effectiveness of the MLA in detecting DoS attacks and compare it with conventional intrusion detection systems for securing the CoAP in the IoT environment. Findings: The research identifies the appropriate node to detect DoS attacks in the IoT network environment and demonstrates how to detect the attacks through the MLA. The accuracy detection in both classification and network simulation environments shows that the k-means algorithm scored the highest percentage in the training and testing of the evaluation. The network simulation platform also achieved the highest percentage of 99.93% in overall accuracy. This work reviews conventional intrusion detection systems for securing the CoAP in the IoT environment. The DoS security issues associated with the CoAP are discussed.

Keywords : algorithm, CoAP, DoS, IoT, machine learning

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