



# A One-Dimensional Convolutional Neural Network Intrusion Detection System on the CICDDoS2019 Dataset in Cloud Environments

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## Abstract

In the modern era, cloud computing has become a cornerstone of computer science and networking. As a result, security concerns and the risk of intrusions have emerged as critical challenges for individuals and organizations managing cloud networks. To address these issues, developing an effective intrusion detection system is crucial. Attackers continuously attempt to breach cloud networks through various forms of attacks, which can lead to significant data breaches and potentially devastating consequences. Hence, identifying vulnerabilities and detecting attacks within cloud environments is of paramount importance. This paper presents a deep learning architecture utilizing a one-dimensional Convolutional Neural Network (1D-CNN) for detecting network attacks in cloud systems. This research identifies nine different types of attacks on cloud networks. The evaluation was conducted using the CICDDOS2019 dataset, yielding an accuracy of 99.92%. These outcomes, as confirmed through practical experiments, highlight the model's high effectiveness.

**Keywords:** one-dimensional Convolutional Neural Network(1DCNN), cloud computing (CC), CICDDOS2019, Deep Learning (DL), Intrusion Detection System (IDS)

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