A Horizontal Federated-Learning Model for Detecting Abnormal Traffic Generated by Malware in IoT Networks

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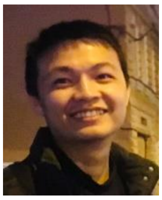
Abstract— **To detect botnet attack traffics in the Internet of Things (IoT) networks, Deep Learning (DL) has received much attention. However, the conventional centralized deep learning technique cannot be utilized to identify a botnet attack and ensure user data privacy simultaneously due to the centralized dataset characteristic. This study addresses the IoT malware traffic detection opportunities afforded by Federated Learning and examines the inherent security concerns of this new learning paradigm. The framework has been evaluated using N-BaIoT, a dataset that collects the network traffic of many real IoT devices infected by malware. In this paper, we compare the effectiveness of the Federated Learning model using famous models such as Convolutional Neural Network, Long Short-Term Memory, and Gated Recurrent Unit with a centralized approach. The results show that Federated Learning achieves high performance and can be used to detect abnormal traffic in IoT. In addition, we experimentally point out that CNN is the model that gives the best results among the three evaluated models.**

Keywords— **IoT, abnormal traffics, malware detection, federated learning, AI model**



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