Fuzzy Logic-based Man-in-the-Middle Attack Detection and Improving Routing Efficiency in the IoT Network

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The Internet of Things (IoT) is a remarkable technology for industrial development, smart homes, intelligent transportation, and more. Typically, in an IoT network, a Man in the Middle attack creates an intrusion node that can, either arbitrarily discard data packets or steal the data, thereby disturbing network performance and reducing network efficiency. While there have been numerous approaches using machine learning techniques were proposed to detect the intrusion nodes, they have often failed to address issues related to throughput and packet loss ratios. Additionally, the conventional approach does not concentrate on routing efficiency. A Fuzzy Logic based Man-in-the-Middle attack detection and Cuckoo Search Algorithm (FLCSA) is proposed to solve this issue for improving routing efficiency in the IoT Network. In this proposed work, the fuzzy logic system is used to efficiently detect intrusion nodes using the inputs such as node degree, node energy, and node delay and outputs that isolate intrusion nodes in the network. The cuckoo search (CS) algorithm is used to form the optimal route from sender to receiver in the network, selecting efficient relays based on node energy, link lifetime, and node bandwidth. The simulation results show that the proposed method has better throughput, increased detection ratio, and minimized network delay.

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