

Sujet 4 : Detection for IoT attacks via artificial intelligence

Description :

Distributed Denial of Service (DDoS) attacks in IoT networks [1] are one of the most devastating and challenging cyber-attacks. The number of IoT users is growing exponentially due to the increase in IoT devices over the past years. Consequently, DDoS attack has become the most prominent attack as vulnerable IoT devices are becoming victims of it. In the literature, numerous techniques have been proposed to detect IoT-based DDoS attacks. However, techniques based on Artificial Intelligence (AI) have proven to be effective in the detection of cyber-attacks in comparison to other alternative techniques. IoT devices are used in different areas like smart homes, education, health care sectors, agriculture, smart vehicles, smart grid, etc. [2]. Homes and urban areas are becoming more intelligent to meet fundamental human requirements, including enhancing security, managing waste, improving air quality, and providing entertainment [3]. Manufacturers are generating several internet-connected IoT devices having inherent security vulnerabilities and flaws. The expeditious spread of vulnerable IoT devices and the accessibility for attackers to discover them results in a continuous mushroom growth of cyberattacks like DDoS, phishing, spamming, click fraud, etc. Among these cyberattacks, DDoS is one of the most prominent attacks originating with the help of botnets made from vulnerable IoT devices. IoT-based DDoS attacks are the most prevalent form of network disruption attack and one of the biggest challenges that security experts and IT consultants are facing.

Travail demandé :

- Studie the targets and motivation of IoT-based DDoS attacks.
- Present a systematic literature review of AI-based tools and techniques used for analysis, classification, and detection of the most threatening in IoT.
- Implement and evaluate some schemes to enhance security against DDoS attack in IoT based AI.

Références :

- [1] Bhabendu Kumar Mohanta, Debasish Jena, Utkalika Satapathy, Srikanta Patnaik, Survey on IoT security: Challenges and solution using machine learning, artificial intelligence and blockchain technology, Internet of Things, Volume 11, 2020.
- [2] Bindu Bala, Sunny Behal, AI techniques for IoT-based DDoS attack detection: Taxonomies, comprehensive review and research challenges, Computer Science Review, Volume 52, 2024.
- [3] M. Figueiredo, D. P. Sodre, R. Medeiros, V. F. Lucena and I. Bessa, "Detection of Cyberattacks in IoT Networks Using Artificial Intelligence: A Comparative Study," *2024 IEEE 29th International Conference on Emerging Technologies and Factory Automation (ETFA)*, Padova, Italy, 2024.

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