Cooperative Agents to Prevent and Mitigate Distributed Denial of Service Attacks of Internet of Things Devices in Transportation Systems

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Abstract : Road and Transport Authority (RTA) is moving ahead with the implementation of the leader's vision in exploring all avenues that may bring better security and safety services to the community. Smart transport means using smart technologies such as IoT (Internet of Things). This technology continues to affirm its important role in the context of Information and Transportation Systems. In fact, IoT is a network of Internet-connected objects able to collect and exchange different data using embedded sensors. With the growth of IoT, Distributed Denial of Service (DDoS) attacks is also growing exponentially. DDoS attacks are the major and a real threat to various transportation services. Currently, the defense mechanisms are mainly passive in nature, and there is a need to develop a smart technique to handle them. In fact, new IoT devices are being used into a botnet for DDoS attackers to accumulate for attacker purposes. The aim of this paper is to provide a relevant understanding of dangerous types of DDoS attack related to IoT and to provide valuable guidance for the future IoT security method. Our methodology is based on development of the distributed algorithm. This algorithm manipulates dedicated intelligent and cooperative agents to prevent and to mitigate DDOS attacks. The proposed technique ensure a preventive action when a malicious packets start to be distributed through the connected node (Network of IoT devices). In addition, the devices such as camera and radio frequency identification (RFID) are connected within the secured network, and the data generated by it are analyzed in real time by intelligent and cooperative agents. The proposed security system is based on a multi-agent system. The obtained result has shown a significant reduction of a number of infected devices and enhanced the capabilities of different security dispositives.
Keywords : IoT, DDoS, attacks, botnet, security, agents