Unprecedented smart algorithm for uninterrupted SDN services during DDoS attack

ABSTRACT

In the design and planning of next-generation Internet of Things (IoT), telecommunication, and satellite communication systems, controller placement is crucial in software-defined networking (SDN). The programmability of the SDN controller is sophisticated for the centralized control system of the entire network. Nevertheless, it creates a significant loophole for the manifestation of a distributed denial of service (DDoS) attack straightforwardly. Furthermore, recently a Distributed Reflected Denial of Service (DRDoS) attack, an unusual DDoS attack, has been detected. However, minimal deliberation has given to this forthcoming single point of SDN infrastructure failure problem. Moreover, recently the high frequencies of DDoS attacks have increased dramatically. In this paper, a smart algorithm for planning SDN smart backup controllers under DDoS attack scenarios has proposed. Our proposed smart algorithm can recommend single or multiple smart backup controllers in the event of DDoS occurrence. The obtained simulated results demonstrate that the validation of the proposed algorithm and the performance analysis achieved 99.99% accuracy in placing the smart backup controller under DDoS attacks within 0.125 to 46508.7 s in SDN.