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An Analysis of Dynamic DDoS Entry Point Localization in Software-Defined WANs

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Abstract: *Software-Defined Wide Area Networks (SD-WANs) are an expanded version of Software-Defined Networking (SDN) that allow modern services and applications to utilize a programmable, adaptive, and efficient wide-area connection. As the Internet of Things (IoT) grows in importance in everyday life, so does the frequency of Distributed Denial of Service (DDoS) attacks. Due to the dispersed nature of the IoT and the limited resources it possesses, SD-WANs are easy prey. These assaults are extremely difficult to detect and localize due to their distributed nature and dynamic traffic patterns, which allow them to elude static criteria and basic profiling methods. Beginning with a description of SDN architecture and the vulnerabilities that are built into it and frequently used by attackers, this article gives a comprehensive study of dynamic DDoS entry point localization in SD-WANs. In addition, it identifies the most prevalent types of distributed denial of service assaults in an SDN environment and reviews recent research on DDoS detection and mitigation. Research in this area focusses on various defence strategies, including hybrid, ensemble, and deep learning-based models; it also includes statistical, policy-based, and moving target defence methods. Research shows that there has been a lot of headway, but no complete answers to the problem of intelligent and dynamic entry point localization in the current literature. Therefore, to fortify SD-WAN defences against ever-changing DDoS threats, this article highlights important hurdles and unanswered questions in SDN security and calls for the creation of adaptive, real-time detection systems.*

Keywords: SD-WAN, Software-Defined Networking (SDN), Distributed Denial of Service (DDoS), IOT Security, Entry Point Localization, Machine Learning, Deep Learning, Dynamic Detection, Network Security