A Bio-Inspired Framework to Mitigate DoS Attacks in Software Defined Networking

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Abstract
Software Defined Networking (SDN) is an emerging architecture providing services on a priority basis for real-time communication, by pulling out the intelligence from the hardware and developing a better management system for effective networking. Denial of service (DoS) attacks pose a significant threat to SDN, as it can disable the genuine hosts and routers by exhausting their resources. It is thus vital to provide efficient traffic management, both at the data layer and the control layer, thereby becoming more responsive to dynamic network threats such as DoS. Existing DoS prevention and mitigation models for SDN are computationally expensive and are slow to react. This paper introduces a novel biologically inspired architecture for SDN to detect DoS flooding attacks. The proposed biologically inspired architecture utilizes the concepts of the human immune system to provide a robust solution against DoS attacks in SDNs. The two layer immune inspired framework, viz innate layer and adaptive layer, is initiated at the data layer and the control layer of SDN, respectively. The proposed model is reactive and lightweight for DoS mitigation in SDNs.

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