Balochistan Journal of Engineering & Applied Sciences (BJEAS) – (p-ISSN: 2518-2706)
Volume 3, No. 2

Software Defined Network Based Algorithm to Mitigate ARP Spoofing in Multi-Lan

Attaullah Khan[1], Hamayoun Shahwani[2], Syed Attique Shah[2], Arbab Sufyan[2], Muhammad Umar Chaudhry[3], Zahid Rauf[2]
[1]Department of Provincial Election Commission, Karachi, Pakistan,
[2]Faculty of Information and Communication Technology, BUITEMS, Quetta, Pakistan
[3]AiHawks, Multan, Pakistan
Corresponding Email: hamayoun.yousaf@buitms.edu.pk

Abstract—Network security is always been an important topic but unfortunately, the potential threats that the network could face from the inside have not been given proper attention. Local Area Networks (LAN) has always been vulnerable due to its non-authenticate and stateless nature from the Denial of Service (DOS) and the Man-In-The-Middle (MITM) attacks. Address Resolution Protocol (ARP) in LANs is vulnerable to lingering threats and its security is underestimated. Time and again solutions have been devised/proposed in legacy networks for securing ARP over a LAN. Notwithstanding a complete solution is still expected. With the emergence of Software Defined Network (SDN), ARP can be secured regardless of LAN being on a single or a multiple switch. With the increasing usage of computers and the networks, the vulnerabilities of ARP Protocol can be addressed with the emerging technologies especially the Software-Defined Networks. This paper examines the existing solutions and proposes to adopt the SDN approach to address the vulnerabilities and devise a module that will inspect ARP Packets and create a temporary table by populating the table with verified MAC addresses for Local Area Network (LAN) communication. This study analyzes ARP attacks both in Single and Multiple Switch environment and proposes a solution to mitigate the attacks by leveraging SDN.

Keywords—ARP Spoofing, DOS Attack, SDN Approach, MiTM Attack, Software Defined Networking