

Vulnerable Paths Assessment for Distributed Denial of Service Attacks in a Cloud Computing Environment

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Abstract : In Cloud computing environment, cloud servers, sometimes may crash after receiving huge amount of request and cloud services may stop which can create huge loss to users of that cloud services. This situation is called Denial of Service (DoS) attack. In Distributed Denial of Service (DDoS) attack, an attacker targets multiple network paths by compromising various vulnerable systems (zombies) and floods the victim with huge amount of request through these zombies. There are many solutions to mitigate this challenge but most of the methods allows the attack traffic to arrive at Cloud Service Provider (CSP) and then only takes actions against mitigation. Here in this paper we are rather focusing on preventive mechanism to deal with these attacks. We analyze network topology and find most vulnerable paths beforehand without waiting for the traffic to arrive at CSP. We have used Dijkstra's and Yen's algorithm. Finally, risk assessment of these paths can be done by multiplying the probabilities of attack for these paths with the potential loss.

Keywords : cloud computing, DDoS, Dijkstra, Yen's k-shortest path, network security

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