

**SSED: Servers Under Software-Defined Network Architectures to Eliminate Discovery Messages**

**Abstract:**

The high speed, low cost, sharing of peripheral devices and central administration features of the Ethernet have led to it being widely trusted as the backbone for recent networks. However, it suffers from many practical limitations leading to a lack of scalability, owing to its broadcast and multicast mechanisms, particularly in relation to the discovery processes. Whilst software-defined networks (SDN) have overcome many legacy network problems, scalability remains a major issue, because broadcasting and multicasting have been inherited. Moreover, the problem is exacerbated with increasing network traffic, which results in higher bandwidth consumption, congestion, and increased probability of a single point of failure. To address this, servers under software-defined network architectures to eliminate discovery messages (SSED) is designed in this paper, and a backbone of floodless packets in an SDN LAN network is introduced. For SSED, flood discovery packets created by the dynamic host configuration protocol in the application layer and the address resolution protocol in the data link layer are considered, respectively. SSED eliminates any broadcast discovery packets with better performance, lowers peak overhead, and introduces an innovative mechanism for defining the relationship between the servers and SDN architecture. Experimental results after constructing and applying an authentic testbed verify that our proposed model has the ability to improve the scalability by removing broadcast packets from the data plane, reduction of control packets in the control plane, lessening peak overhead on the controller, preventing it experiencing failed requests, offering better response time, and providing more efficient performance.