

ABSTRACT

The advancement of information technology has driven the need for efficient and reliable data center network architectures that can handle high traffic loads optimally. One widely adopted solution is the Spine-and-Leaf architecture, known for its high scalability and efficient traffic distribution. This research analyzes and compares two types of outbound paths in the Spine-Leaf architecture, namely Type 1 and Type 2, with a focus on outgoing traffic performance. The tests were conducted through simulations using Mininet and the Floodlight SDN controller and evaluated based on three Quality of Service (QoS) parameters: throughput, delay, and jitter. The results indicate that Type 1 performs better under light traffic conditions, showing higher throughput and lower delay. However, under heavy traffic, Type 2 demonstrates more stable performance, especially in managing jitter and delay spikes. These findings can serve as a reference in selecting appropriate data center network topologies according to workload demands

Keywords: Spine-and-Leaf, Data Center, Outgoing Traffic, SDN, Throughput, Jitter