

ABSTRACT

Throughout its history, numerous communication technologies have been developed, both in software such as IP and routing protocols, and hardware such as switches and routers. Initially limited to local-area communication, technology has now expanded to encompass continents. Nevertheless, natural network disruptions, such as cable breaks due to natural disasters or human intervention, or sudden power outages that cause telecommunications equipment to shut down, remain a threat to telecommunications networks, both small and large-scale. To address these challenges, technologies continue to evolve, such as the Multi-Protocol Label Service (MPLS) protocol, which accelerates data transmission and traffic manipulation with the aid of sophisticated routing protocols like OSPF or IS-IS.

This study employed an experimental method by simulating 10 scenarios in an MPLS network using EVE-NG to evaluate the quality of service between the ISIS and OSPF protocols when disruptions occur due to link failures. Information was obtained through observations of the simulation results, which were performed in 10 scenarios with 15 repetitions, presented in graphs and tables. The results were analyzed using a comparative method based on service quality parameters.

The results obtained in this study indicate that IS-IS and OSPF routing can be simulated well together with MPLS in the EVE-NG software simulation. Based on the observation results, IS-IS routing provides better QoS performance than OSPF routing when link failure occurs. The QoS results are in the form of packet loss: 7.57%, Delay: 79.20%, Jitter: 77.78%, Throughput: 35.37%.

Keywords: *MPLS, Link Failure, OSPF, IS-IS, QoS*