

## **ABSTRACT**

*The rapid development of the world of technology makes data exchange in global communication very important. In order for data exchange between companies to communicate with each other using devices that have low cost and high reliability, the Border Gateway Protocol (BGP) routing method uses Free Range Routing (FRR). FRR is software created from a collaboration between cumulus foundation and linux foundation which is enabled to run at the network layer and can run the BGP routing protocol. This study uses the User Datagram Protocol (UDP) protocol to check the network quality of topology 1 (4 FRR) and topology 2 (6 FRR) in various data sizes, namely 10 MB, 20 MB, 30 MB, 40 MB, and 50 MB using scenarios without failover and failover. The test of topology 1 with scenario without failover shows the average throughput value is 10.805 Mbps, the average delay is 3.441 ms, the average jitter is 0.747 ms, the average packet loss is 0%, in the failover scenario the average throughput is 10.754 Mbps, the average the average delay is 100.039 ms, the average jitter is 0.928 ms, the average packet loss is 0.349%. Testing topology 2 with scenarios without failover shows an average throughput value of 10,797 Mbps, an average delay of 124,786 ms, an average jitter of 1,132 ms, an average packet loss of 0%, in a failover scenario with the best failover route, the average value shows throughput 10,734 Mbps, average delay 445.864 ms, average jitter 1.096 ms, average packet loss 0.341%. In the two test topologies, the results of the Quality Of Service (QoS) parameter using topology 1 are better than topology 2. The test results are categorized as "very good" performance in the scenario without failover and categorized as "very good" to "moderate" performance in the failover scenario.*

**Keywords:** BGP, FRR, QoS, UDP, Failover