ABSTRACT

The constraints in sending information on the internet network can be caused by device failures and link failures. In addition, the gateway router as the only path to the internet service provider (ISP) network can also experience downtime resulting in users not being able to access the internet connection. So to overcome this, it is necessary to add a backup router. One method for carrying out the backup process is to use a virtual router redundancy protocol (VRRP). This study focuses on analyzing the performance of VRRP by utilizing the Border Gateway Protocol (BGP) routing protocol to support internet connections between different ISP networks using Vyos routers. Tests are carried out with scenarios without failover, failover1 and failover2 by testing TCP and UDP traffic. Analysis of the test results in the form of network quality of service (QoS) parameters including throughput, delay, packet loss and jitter and convergence time between main links and backup links. The test results from the scenario without failover on TCP show the highest throughput value of 7.78 Mbps, the highest delay value of 25.74 s, the highest jitter value of 1.82 s and the highest packet loss value of 0%, while UDP shows the highest throughput value of 4.64 Mbps, the highest delay value is 196.91 s, the highest jitter value is 0.83 s and the highest packet loss value is 86.5 %, in the failover1 scenario on TCP it shows the highest throughput value of 7.78 Mbps, the highest delay value is 25.77 s, the highest value of the highest jitter is 5.39 s and the highest packet loss value is 0%, while UDP shows the highest throughput value of 4.64 Mbps, the highest delay value is 196.91 s, the highest jitter value is 0.66 s and the highest packet loss value is 86.51% , in the failover2 scenario the TCP shows the highest throughput value of 7.78 Mbps, the highest delay value is 25.77 s, the highest jitter value is 5.38 s and the highest packet loss value is 0%, while in UDP it shows the highest throughput value of 4.64 Mbps, the highest delay value is 188.97 s, the highest jitter value is 0.62 s and the highest packet loss value is 86.31%. The test results for the convergence time parameter in the priority 200 to priority 150 scenario show an average value of 4.85 s and in the priority 150 to priority 100 scenario show an average value of 5 s.

Keywords: *VRRP, BGP, QoS, VyOS, Convergence Time.*