ABSTRACT

This study seeks to implement DMVPN and will also add a redundancy system, namely the use of dual hubs which aims to eliminate single point of failure so that the DMVPN system will have high availability capabilities in the form of load balancing and failover. This DMVPN network will be built using an alternative open source router called VyOS. The scenario used is a condition where both hubs turn on, turn off one hub and turn off both hubs. This study will measure Quality of Service such as throughput, delay, jitter and packet loss and convergence time in failover testing. The results obtained from testing the scenario of the two hubs on are throughput reaching 18.28 Mbit/s (standard >2.1Mbps) where the larger the data sent, the higher the throughput value, the delay parameter is 46.6 ms (standard <150ms). , the jitter parameter is 1.29 ms (standard 1 to 75ms) and the packet loss parameter is 0.01% (standard <3%). While in the scenario one of the hubs is turned off, the throughput reaches 17.27 Mbit/s (standard > 2.1 Mbps) where the larger the data sent, the higher the throughput value, the highest delay parameter is 1094 ms (standard > 450ms). The jitter is 7.35 ms (standard 1 to 75ms) and the packet loss parameter is 5.05% (standard 3 to 14%). In the failover test, the convergence time for transmission from hub to spoke takes 9 seconds since the main line is disconnected until data transmission moves to the backup line, while transmission between spokes takes 51 seconds to move to the backup line. From the results of this study it can be concluded that the use of two hub routers gets better results than using only one hub router.

***Keywords**:* DMVPN, *dual hub, load balancing, failover*, VyOS, QoS