

ABSTRACT

The RT/RW Net network is a community network that is widely used to provide internet access services at affordable costs. In its management, the RT/RW Net network often faces remote access problems to network devices due to limitations of static public IPs and the use of dynamic public IPs from internet service providers. The commonly used solution is a conventional Virtual Private Network (VPN), such as OpenVPN, but this solution has limitations in terms of routing efficiency, use of device resources, and quality of network service. As software-based network technology develops, Software-Defined Wide Area Network (SD-WAN) has emerged as an alternative solution, one of which is through the implementation of SD-WAN. This research aims to evaluate the performance of SD-WAN technology on RT/RW Net networks based on the Quality of Service (QoS) approach referring to the ITU-T Y.1541 standard, and compare it with conventional VPN OpenVPN protocols with a combination of DDNS and port forwarding. The parameters analyzed include End-to-end Delay, Delay Variation (Jitter), Packet loss Ratio, hop count, CPU utilization, and traffic utilization. Testing was carried out in an RT/RW Net network environment with the same test scenarios for both technologies. The research results show that SD-WAN has better performance compared to conventional VPN based on ITU-T Y.1541 QoS parameters. SDWAN produces 63.66% better delay than conventional VPN, and SDWAN jitter is 50.57% better than conventional VPN. The packet loss value on SDWAN was recorded at 0.00%, while conventional VPN experienced packet loss of 5.51%. In terms of routing, SDWAN uses an 81.82% shorter path with 2 hops, compared to conventional VPN which reaches 11 hops. In addition, SDWAN shows an average CPU utilization of 11% and traffic utilization of 210.5 kbps, while conventional VPN is 7% and 85 kbps respectively. SDWAN has the scope of access to all services, while Conventional VPN only has 1 specific service from port forwarding. Based on these results, it can be concluded that SD-WAN technology is more optimally used as a remote access solution on RT/RW Net networks compared to conventional VPN.

Keywords: *RT/RW Net, SD-WAN, VPN, QOS, ITU-T Y.1541*