## ABSTRACT

The rapid development of this technology is side by side with the development of computer networks. In designing an optimal network infrastructure, an adaptable, dynamic, and manageable network architecture is need by hardware or software adjustments. Software-Defined Network (SDN) is a new architecture created to solve traditional network problems. However, as the SDN model itself evolves, its application to multi-tenant virtual networks poses many security challenges. In a multi-tenant environment, tenants can share network elements while still isolating them from each other, so the evolution of SDN technology has several security vulnerabilities. In this paper, an analysis of the security of a multi-tenant virtualized network based on SDN is presented, using the network slicing method using FlowVisor to strengthen the isolation of each slice on the SDN network. SDN virtual network simulation a done using Mininet. The evaluation of the performance of the SDN simulation network uses three test scenarios, including a connectivity test, a functionality test, and a strong is isolation test. The results of this study are Quality of Service (QoS) values with parameters of Throughput, Delay, and Jitter in Transmission Control Protocol (TCP) and User Data Protocol (UDP) packets. The value of the QoS parameter generated in the TCP and UDP Throughput test obtained a very good value or excellent according to the TIPHON standard. Then, the UDP and TCP Delay parameters obtained a value in the Good category according to the ITU-T standard, and the Jitter parameter obtained a Good category according to the ITU-T standard. Q, both on a regular SDN network and with FlowVisor. The results of resource utilities testing are 3.5% CPU usage, and 0.6% Memory for connectivity testing without slicing, whereas 25.3% CPU usage, and 7.2% Memory usage with slicing. Then for CPU, each slice gets a value higher with using FlowVisor than without FlowVisor. The cause of the difference in the percentage of CPU and Memory usage is due to the process in FlowVisor in performing network slicing techniques so that it requires more resources. This test shows evidence that using FlowVisor can create strong isolation between slices, because traffic on one tenant does not interfere with traffic on other tenants, and only hosts on one tenant can connect.

Keywords— Software Defined Network (SDN), Network Slicing, FlowVisor, Transmission Control Protocol (TCP), User Data Protocol (UDP)