ABSTRACT

*Software Defined Network (SDN) is one of the evolutions in the needs of today's computer networks. Where SDN offers an efficient network concept and becomes centralized due to the separation between the control plane and the data plane. The main concept of Software Defined Network is the centralization of network control with all settings in the control plane. However, the concept of a centralized network certainly has weaknesses in terms of network security itself. Where the tendency to get attacks will be greater, such as Distributed Denial of Service (DDoS) attacks. Therefore, a security system is needed that functions to prevent DDoS attacks while blocking attacks in the SDN network. This study focuses on analyzing DDoS attacks using the Intrusion Prevention System (*IPS*) security method centrally on the Software Defined Network network. Snort functions as a detector of packets that are considered dangerous and the Ryu Controller acts as a firewall to block attacks. The scenario in this study is to take QoS throughput data, CPU Usage and Memory Usage under normal conditions, when an attack is carried out without* IPS *and when an attack is carried out with* IPS *integration. The attack packet will be increased gradually from 10 packets/s, 100 packets/s, 1000 packets/s and 10000 packets/s to test the QoS value. Based on the test results, the transfer throughput value on TCP was obtained at 7.80 GBps when the server was in normal condition. While* UDP *was 778 MBps when in normal condition. The Throughput value began to decrease when an attack was carried out and decreased further when the attack packet was increased to 10000, which was 3.60 GBps for TCP and 338 MBps for* UDP. *However, the throughput value began to increase when the attack was integrated with* IPS*, which was 3.92 GBps when the 10000* TCP SYN *Flood attack and 373 MBps when the 10000* UDP *Flood attack. CPU and memory performance increased when* IPS *was integrated, which was 34.50% when the* TCP SYN *Flood attack and 37.90% when the* UDP *Flood attack. This percentage increase was due to the increasing number of system tasks in blocking attacks.*

Keywords: *DDoS, IPS, Ryu, SDN, Snort*