ABSTRACT

Load balancing is a mechanism to divide the computing load into multiple servers. This load balancing aims to optimize resources and increase throughput so that the server does not experience overload. Software Defined Network (SDN) is a new computer network technology that separates the functions of the Data Plane and control plane. In SDN, an OpenFlow protocol is used to control/manage traffic flows, but this OpenFlow has been defined and cannot be changed or modified. To solve the above problem,

Programming Protocol-independent Packet Processors (P4) is a programming language for top-down programming that can determine how pipelines on switches work and how these packets can be processed. This P4 can overcome the weakness of OpenFlow, which is less flexible in controlling/regulating traffic flow and allows running load-balancing processes.

In this Final Project, simulation and load balancing analysis have been performed on a programmable network infrastructure based on the P4 language. A round-robin algorithm with P4 has an average throughput value of 127.61 KB/s. The IP hash algorithm with P4 has an average throughput value of 127.50 KB/s. The round robin algorithm has an average response time value of 3.13 ms; in the IP hash algorithm, the average value is 12.16 ms. The response time value of the P4-based system with the round robin algorithm is better than the IP hash algorithm, and the request loss of the two systems can distribute the request well so that the request loss is 0%.

Keywords: *Load Balancing, Data Plane, P4, Round Robin, IP hash*