

## ABSTRACT

*The development of network technology is growing and continues to increase, to meet the needs and create a reliable network, SDN (Software Defined Network) is one of them. SDN is a network architecture in which network control is centered on a controller that is programmed to be able to manage the process of running data to the center and sending it to the client. Therefore, the controller on the SDN is an important element in network performance. SDN has many controllers such as, NOX, POX, ONOS, Beacon, Floodlight, MuL, Maestro, Ryu, and others. Each controller has differences in advantages and disadvantages that affect network performance.*

*In this final project research, the SDN technologies that will be used as controllers are Floodlight, POX and Ryu which will be installed on the Raspberry-Pi device to minimize the use of PC devices on the SDN network. The analysis that will be carried out is to compare the QoS (Quality of Service) of the network built using Floodlight, POX, and Ryu controllers with the OSPF (Open Shortest Path First) routing protocol..*

*The test results show that QoS in this final project has results in accordance with the standards of TIPHON (Telecommunication and Internet Protocol Harmonization Over Network) with measurements without background traffic and background traffic of 20Mb, 40Mb, 60Mb, and 80Mb. The highest throughput value of 7.14 Mb/s was achieved using a POX controller on 60Mb background traffic, the best delay and jitter values were achieved using the Ryu controller with delay and jitter values of 0.079 ms and 0.042 ms. The packet loss value for each controller reaches 0% except for the floodlight controller with 80Mb background traffic, the packet loss value is 0.59%.*

**Keywords:** *Software Defined Network, Floodlight, POX, Ryu, Raspberry-Pi, Quality of Services, Open Shortest Path First.*