

## **ABSTRACT**

*Technology in general is to facilitate all activities. Software Defined Network is a concept of a new approach in network architecture. The SDN concept uses the OpenFlow protocol and separates between the Control Plane and the Data Plane. The Control plane is moved out of the network device so that only the Data Plane is inside the network device, routing policies become centrally through the Controller. Centralized controlling in SDN makes network settings easier and more flexible. The last few years SDN technology has become one of interesting topics for researchers, one of the interesting is SDN Development regarding the implementation of the SDN architecture with Internet of Things (IoT) device.*

*Banana Pi is a Single Board Computer (SBC) with specifications that are able to implement the SDN architecture model, which functions as a controller like a server capable of managing network topology. This controller will be connected to the SDN switch and both use Banana Pi devices. In this research, a Monitoring System application will be made which will provide a resource information (CPU usage, RAM usage), and Quality of Service (QoS).*

*QoS parameter measurement uses Iperf3 to measure jitter, packet loss, and actual bandwidth with a 100 mbps, 150 mbps, and default depend on the testing program of bandwidth and 100 MBytes, 125 MBytes, and 150 MBytes of data size. For the results categories jitter is good, packet loss is very good with value 0%, then the actual bandwidth is very good category. And the D-ITG testing program to measure throughput with very good categories. Then for the results of device quality resources on Banana Pi using a monitoring system that has been applied to the network, results shows <50% for server and <20% for switch device. So the results of the analysis have met the reference, therefore Banana Pi can be used on the network designed.*

**Keyword:** *Software Defined Network, Single Board Computer, Controller, Monitoring System Banana Pi*