

## **Abstract**

**The problem of Distributed Controllers (active-active) using synchronous message exchange is that every message sent by controller A (sender) will be responded by controller B (receiver), then can make the process of sending the next message after receiving that response. This can cause a decrease in performance and increase the workload on the controller because every message that will be responded to requires a direct process to produce acknowledgments. Therefore, this research was developed to improve the message exchange mechanism and reduce the burden of message resources in sending message information between controllers. This study proposes to use asynchronous messages as message exchanges with the 3 in 1 method, which is the mechanism carried out by the process of sending three messages and producing a reply in one acknowledgment. The test results of the two methods obtained the highest percentage of CPU Usage on the 3 in 1 method of 7.90% while the highest value on the one-message one-acknowledgment method was 9.57%. Based on these results the 3 in 1 method obtained a difference value of 1.67% lower than the one-message one-acknowledgment method. Therefore, with the use of the 3 in 1 method the workload on each controller is reduced. The 3 in 1 method also proves higher performance results and faster failover times.**

**Keywords: asynchronous, distributed controller, message exchange, software defined network**