## ABSTRACT

Equal Cost Multipath Routing (ECMP) is a routing application where all available paths between two nodes is utilized by statically mapping each path to possible traffics between source and destination hosts in a network. This configuration can lead to congestion if there are two or more traffics being transmitted into paths with overlapping links, despite the availability of less busy paths.

Software Defined Networking (SDN) has the ability to increase the dynamicity of ECMP by allowing controller to monitor available bandwidths of all links in the network in real-time. The measured bandwidth is then implemented as the basis of the calculation to determine which path a traffic will take.

In this final project, a SDN-based ECMP application that can prevent network congestion is made by measuring available bandwidth of each available paths beforehand, thus making different traffics transmitted on non-overlapped paths as much as possible. The proposed increased the throughput by 14.21% and decreased the delay by 99% in comparison to standard ECMP when congestion occured and has 75.2% lower load standard deviation in comparison to round robin load balancer.

Keyword : ECMP, Overlapping, SDN, load balancing