

## **ABSTRACT**

Decoupling function of control logic (controller) with the packet processing (data plane) on a Software-Defined Network architecture leaves some questions related to the reliability, scalability and its performance. Controller design placement is one of the key issues on the SDN architecture, the right strategy can reduce the number of required controllers and balancing the load of the controller to maintain network reliability and performance. Selection of this design: The Controller Placement Problem, used to answer two major questions on the design of SDN: how many controllers are needed and where were the optimal placement in the Network. This thesis propose SDN architecture methodology design that taking into account the existing traditional network topology to maintain the network operational reliability. Topology design is made by determining the 'candidate' placement refers to the topology and traffic flow of the existing network then the optimization is doing by analyzing the design parameters on the candidate controller using Pareto-based Optimal Controller-placement (POCO) framework to obtain final topology design that meets the requirements of the optimum delay, network resiliency and the maximum load of the controller at the topology.