ABSTRACT

Internet is expected to be available every time, so that the services ran on it are able to be used any time. To achieve high availability Internet network, redundancy is used by employing more than one gateway. So, if one gateway is down, the other gateway will take the job of the dead gateway. In the access layer, we use first-hop redundancy as the redundancy system.

In this research, author design a system that has first-hop redundancy and load balancing function. The system is designed to handle more than two gateways. The system is designed using software defined networking paradigm. The system uses POX as controller and Openflow as Controller Data-path Protocol Interface between switches and controller. The system is also simulated on the mininet to examine the capability of the system by measuring some parameters: fail over delay, load distribution, resource utilization and overhead on the bipartite topology.

Of the examination results and analysis, the system is able to run the first-hop redundancy which yields fail-over delay below 140 ms for single flow. The load balancing function is also able to run and leverage the performance of the network, even though the distribution of the load is not quite fair yet. The scalability of the system should be improved so that the system can handle various topology.

Keywords: first-hop redundancy, load balancing, software defined networking, Openflow