

ABSTRACT

Data center is the center of data traffic that has a large-scale network topology. The design of the data center network topology must meet the criteria of high bandwidth, low latency, communication balance. fat-tree is one of the topology that is often used in the data center. Data center traffic is very dense, single data link transmission is no longer efficient because it can cause fuller full bandwidth due to the same packet stack than that if there is termination on one link then the communication will end. Software defined network (SDN) is a network paradigm where the control plane is separate from the forwarding plane.

In this final project will be implemented the concept of multipath TCP based Software defined network to analyze TCP multipath performance in overcoming congestion with load balancing method. Multipath TCP will build multiple subflows from some or all sending IPs to some or all of the receiving IP, so it can be able to set how much bandwidth will be streamed on the path. This method allows network administrators in the data center to have control over network traffic and therefore has great potential to further improve network performance in terms of efficient use of network information resources.

The test results obtained are a one-way delay parameter that meets ITU-T G.114 standard under 400 milliseconds or 150 milliseconds, retransmission and RTT better than single path, and throughput value 50% greater than single communication path with an average bandwidth of 43,521 Mbit / s while a single path gets an average of 27,247 Mbit / s. in traffic scenario 40% -60% and 20% -80% where background traffic affects bandwidth links by increasing link bandwidth 1 and reducing bandwidth link 2 because multipath TCP has set 40% -60% and 20% -80% traffic on links. When throughput on link 1 is reduced because the background traffic flowing on link 1 affects the percentage of 60% and 80% in link 2 thus reducing throughput in link 2.

Keywords: *Software Defined Network, Multipath TCP, OpenFlow, Data center*