

ABSTRACT

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In the last decade, the volume of data produced and stored on a global scale has increased significantly. In the quest to keep the consumption of information and services occurring uninterrupted, companies are investing in redundant links in order to reduce the chances of an unavailability of Internet access. Thus, having redundant links it is possible to use them not only during unavailability situations, but also on a daily basis balancing the load between them. Load balancing between links can be accomplished using multipath routing. Thus, data streams can be distributed simultaneously over more than one path between source and destination. However, some networks like Ethernet use the single path packet forwarding model based on the Spanning Tree Protocol (STP) to avoid loops on the network, in situations where multiple switches Ethernet are interconnected. This feature does not allow the use of idle links to reduce path congestion and increase the aggregate network bandwidth. As a solution, this work presents a proposal for a load balancing mechanism between paths using software defined networks (SDNs). The proposed mechanism, called MLB (Multipath Load Balance), is based on a load balancing mechanism using SDN networks proposed in the literature. However, unlike this mechanism in the literature, it performs path computation with disjoint links and has a switching control that checks whether the current path occupation exceeds 50% of its capacity and whether the potential new computed path has an occupation at least 10% less than the current path, so as not to change paths without a reasonable gain. Therefore, as a way to evaluate the functioning of the proposed mechanism, this work also presents a performance evaluation that compares the functioning of the two mechanisms with the standard operating mode of the SDN OpenDaylight controller (ODL). The results obtained show that with the use of MLB it was possible to increase the value of the aggregated bandwidth by 95% and decrease packet loss by about 44,2% compared to the standard ODL operating mode.

Keywords: SDN; Load balancing; Multipath routing.