Optimizing Network Latency with Fast Path Assignment for Incoming Flows

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Abstract : Various flows in the network require to go through different types of middlebox. The improper placement of network middlebox and path assignment for flows could greatly increase the network latency and also decrease the performance of network. Minimizing the total end to end latency of all the ows requires to assign path for the incoming flows. In this paper, the flow path assignment problem in regard to the placement of various kinds of middlebox is studied. The flow path assignment problem is formulated to a linear programming problem, which is very time consuming. On the other hand, a naive greedy algorithm is studied. Which is very fast but causes much more latency than the linear programming algorithm. At last, the paper presents a heuristic algorithm named FPA, which takes bottleneck link information and estimated bandwidth occupancy into consideration, and achieves near optimal latency in much less time. Evaluation results validate the effectiveness of the proposed algorithm.

Keywords : flow path, latency, middlebox, network

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