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Efficient Multipath Routing Schemes for Congestion Minimization

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Abstract

Unlike traditional routing schemes that route all traffic along a single path, multipath routing strategies split the traffic among several paths in order to ease congestion. We identify the major essential requirements of multipath routing. A multipath routing scheme should limit the number of paths per destination, the end-to-end delay of each path and the delay variance (delay-jitter) between different paths that ship traffic towards the same destination. In spite of the important benefits provided by multipath routing schemes, they got relatively little attention in the literature; moreover, most studies focused on heuristic methods. This work provides the first comprehensive study that establishes *practical* multipath routing strategies with *provable performance guarantees*, in terms of load balancing and congestion minimization.

Keywords: Multipath Routing, Delay-Jitter, Load Balancing, QoS.