



Aggregation of internal topologies for Multi-Constrained QoS Routing

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Abstract: As the network grows larger and larger, it becomes impossible to broadcast the whole topology to every node in the network, as it takes up an enormous amount of space, time and bandwidth. One solution to deal with this scalability problem is to group nodes into manageable domains and then aggregate the internal topologies of these domains before broadcasting them to other domains. This process is known as Topology Aggregation. Topology Aggregation often introduces distortion, that is, deviation from the original topology. It becomes very difficult to do Topology Aggregation within bounded distortion. With this kind of distorted and summarized view of domains available to a node, Multi-Constrained QoS routing becomes extremely difficult. The major contribution of this paper is a novel QoS parameter representation with a new aggregation algorithm and a QoS-aware routing protocol (Line Segment Routing Algorithm). We examine the impact of re-aggregation policy, the criteria that trigger the re-aggregation and re-advertisement of domain topology. The QoS representation captures the state information about the network with much greater accuracy than the existing algorithms. The new approach achieves very good performance in terms of delay deviation, success ratio and crank back ratio.

Keyword: hierarchical routing, QoS, topology aggregation, delay- bandwidth sensitive, Isra.