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TOPOLOGY AGGREGATION FOR NETWORKS WITH TWO
ADDITIVE METRICS

By

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ABSTRACT

Topology Aggregation is concerned about summarizing a network domain in a concise manner. This thesis deals with topology aggregation for networks with two additive metrics. Summarizing such a network domain is difficult for a number of reasons. First, computing paths between two nodes with two additive metrics is NP-Hard. Second, it is unclear how the quality of two paths with two additive metrics can be compared, which leads to the difficulty in determining the quality of topology aggregation schemes. In this thesis, we develop a method to evaluate the quality of aggregation schemes for networks with two additive metrics, propose to compute the full mesh representation of a domain using the limited path heuristic and demonstrate that the information carried in the full mesh representation is very close to that in the original network representation. We also develop and study a number of schemes to reduce the full mesh representation to the spanning tree based representation. The performance of the proposed schemes is studied through simulation. The results show that minimum spanning tree based schemes yield reasonable performance.