Anycast Routing Problem on WDM Ring Network

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Abstract

Anycast refers to the transmission of data from a source node to (any) one member in the group of designed recipients in a network. When the physical network and the set of anycast requests are given, the WDM anycast routing problem (WARP) is to find a set of light-paths, one for each source, for anycasting messages to one of the member in the anycast destination group such that not any path using the same wavelength passes through the same link. The goal of the WARP is to minimize the number of used wavelengths. In this paper, the WARP is formulated and studied, since WARP is NP-hard, several heuristic algorithms and a hybrid method which combines heuristic and simulated annealing techniques are proposed to solve it. These algorithms are used to find the close-to-optimal solution. Simulated results show that the proposed algorithms are able to achieve good performance.

Key words：Anycast routing;Heuristic algorithm;NP-hard;Simulated annealing;WDM ting