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Genetic Algorithms for Multiple Multicast on WDM Ring Network

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Abstract

The optimal multiple multicast problem (OMMP) on wavelength division multiplexing ring networks without wavelength conversion is considered in this paper. When the physical network and the set of multicast requests are given, OMMP is the problem that selects a suitable path or (paths) and wavelength (or wavelengths) among the many possible choices for each multicast request under the constraint that not any paths using the same wavelength pass through the same link such that the number of used wavelengths is minimized. This problem can be proven to be NP-hard. In the paper, a formulation of OMMP is given and several genetic algorithms (GAs) are proposed to solve it. Experimental results indicate that the proposed GAs are robust for this problem.

Key words : Genetic algorithm; Multiple multicasts; Wavelength division multiplexing rings; Single-hop; Drop and continuous