

An improved simulated annealing algorithm to avoid crosstalk in optical omega network

ABSTRACT

A major problem called crosstalk is introduced by Optical Omega Network (OON), which is caused by coupling two signals within a Switching Element (SE). It is important to focus on an efficient solution to avoid crosstalk, which is routing the traffic through an N times N optical network to avoid coupling two signals within each SE. Optimal routing in OON is an NP-hard problem. Many heuristic algorithms were designed by many researchers to perform this routing. Routing the messages in degree-decreasing of the message conflicts gave best performance among them. When Simulated Annealing (SA) algorithm was used to solve the problem, it gave good results. It is a good idea to use these two algorithms to improve the performance. This paper presents an Improved SA (ISA) for message routing in OON that combines SA algorithm with the best heuristic algorithms. Simulation Results show that the proposed ISA can be a competitive choice for solving the crosstalk problem.

Keyword: Optical omega network (OON); Simulated annealing algorithm; Message routing; Crosstalk