

A Fault-Tolerant Routing and Wavelength Dimensioning for Dynamic WDM Optical Networks

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Optical communication networks transmit a large amount of data at speeds of Giga or Terabits per second, which means that the presence of one or more faults from link outage in the network can cause significant data loss. Therefore, it is extremely important to ensure quality of service (QoS) to the customer by protecting the network against faulty links. Indeed, the probability of two links failing simultaneously is great enough to justify designing the network with a tolerance of up to two simultaneous link faults.

In this paper, a heuristic is presented that jointly solves the problems of routing and wavelength assignment (RWA) in a way that allows network tolerance for any link or pair of links that fails simultaneously. Additionally, this paper provides the information necessary to re-route the connections that have been affected by the occurrence of one or two link failures. The method presents a more efficient solution to this problem than the current methods.