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Algorithm for Minimizing Wavelength and Number of Hops in WDM Network

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ABSTRACT

This paper is based on a novel heuristic algorithm for routing and wavelength assignment in virtual wavelength path routed WDM network. In this paper, we have considered a wavelength routed WDM optical network and the Heuristic algorithm is implemented on it. The term heuristics is used for algorithm, which finds solution among all possible ones, but they do not guarantee that the best solution will be found. Therefore they may be considered as approximate and not accurate algorithms. Heuristic algorithm has its own structure, so it never runs slowly and never gives very bad results. The results are always close to the best solution.

In this paper the objective of this algorithm is to minimize the requirement of wavelength in any network topology demanded by network traffic. It also minimizes the hop length between source and destination nodes in the traffic. As wavelength and number of hops get reduced, the cost of the network also gets reduced and maximizes the resource utilization.

In the first phase of this algorithm, we assigned minimum hop length to each route demanded by traffic and also assigned wavelengths to each route. In second phase of algorithm effective rerouting is performed to reduce the number of wavelengths required in the network and it also minimizes the hop length of each rerouted route. By minimizing wavelength requirement, the need of wavelength converter gets reduced, so that the network cost is also reduced.

Along with the implementation of heuristic algorithm, we have found out few more parameters such as Network Congestion and Network wavelength converter requirement. This Network Congestion on each link of network is used for calculation of Network Wavelength Requirement, and Network wavelength converter Requirement.