

A NEW HEURISTIC ALGORITHM FOR VIRTUAL TOPOLOGY RECONFIGURATION IN OPTICAL WDM NETWORKS

SUMMARY

Recent growth in the Internet usage forces for Internet Service Providers to provide higher bandwidths, speeds, to the users. Users would like to view streaming video, make online conferences over the Internet. This bandwidth hunger applications are not currently being used easily because of the limitations of the current network infrastructure.

Optical WDM networks are the leading candidate to solve this bandwidth and speed problem. They offer up to Tbps bandwidth which is much higher than the current fastest bandwidths which are up to tens of Gbps. Optical WDM technology is based on wavelength division multiplexing which made these Tbps bandwidths feasible. Same fiber can carry many wavelengths so that usage of fiber is growing with the number of wavelengths used.

On top of the physical topology, Optical WDM Networks use Virtual Topology in order to get the most from the network. Many studies have been made for designing Virtual Topologies. As time passes, the initial Virtual Topology of a network may become inefficient for the current traffic conditions. Therefore virtual topology reconfiguration algorithms are used in order to make changes to the current virtual topology so that it fits to changing conditions.

In this study a new heuristic algorithm for Virtual Topology reconfiguration is proposed. Heuristic uses a basic and promising approach to achieve optimal virtual topology. In our study, the objective of reconfiguration is to minimize the load of the maximally loaded lightpath. In order to achieve minimization of the load on the maximally loaded lightpath, our algorithm tears down lightpaths without increasing the load on the maximally loaded lightpath. Then, it sets up lightpaths in order to decrease the load of the maximally loaded lightpath. The advantages of our algorithm are: It does not need to know the future traffic pattern. Its complexity is low so that it can be run online. Moreover the network administrator can decide how much the network will be interrupted.