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27. Efficiency Enhancement through Dynamic Allocation of Switching Path in All-Optical Networks

ABSTRACT

The inability of wavelength conversion between links in All-Optical networks causes congestion and hence results in Packet loss. We have Proposed a GMPLS-Based All-Optical networks that would dynamically locate path for switching in congestion, using maximum utilization of Control Plane resources thus ensuring guaranteed QOS. It is widely accepted that Generalized Multi-Protocol Label switching (GMPLS) is an attractive intelligent technology for different networks. GMPLS comprises of IP-based protocols to support routing, signaling and link management that, when properly organize, will simplify network operation and offer the possibility of potentially lucrative novel on-demand services. Consequently, there have been significant developments in the standardization of GMPLS and the salient parts of the GMPLS architecture have been well-defined. In the context of all-optical networks, the neighbor nodes are interconnected by fiber links and each fiber contains multiple wavelengths. A lightpath is an all-optical -wavelength channel connecting two end nodes span across multiple fiber links. In the case of without wavelength conversion, the same wavelength must be reserved along these fiber links, an identical wavelength needs to be reserved along the selected route to establish a lightpath. Such aggregation decreases the quantity of routing message to be disseminated. Lightpath based Flooding mechanism (PF) disseminate a single wavelength state in the case of network startup, new node adding in or link failure, etc. In these cases, the link state information flooding should be used. We have proposed a “Least Routing Mechanism (LR)”, to achieve major enhancement in provisions of control plane load. Maximum utilization of data resources can improve performance and efficiency of the Lightpath based Flooding (PF) network. This technique will find the required wavelength conversion unlike the existing techniques. When there are multiple free wavelengths along the route, one of them will be randomly selected.

Proposed network uses GMPLS with TrafficFinder and hence can overcome the limitations of the existing scenario. TrafficFinder is software, used to calculate traffic and estimate trunks, servers or agents using defined statistical formulas. This uses the defined traffic model to calculate the number of trunks needed in an alternate-routing overflow trunk group. Simulation results confirm our analysis and furthermore, reveal that our proposal also achieves significant performance improvement in terms of blocking probability and setup latency