Searching of optimum characteristics of multi-layer switching architecture in all-optical networks

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Abstract:
The growth of Internet increases the range of future services that demand more network capacity and higher data rates. Network and system concepts are evolving accordingly using fiber-optic networks with transmission speeds more than 40 Gb/s as the base environment. Therefore, the creation of completely optical networks corresponding equipment is required. One of the basic elements of such network is a switchboard. While designing competitive switchboard, we should consider several services including the possibility of authorization, performance, number of ports, encryption, data compression, class of service (CoS) and quality of service (QoS). The paper proposes a new approach to the construction of switchboards, where the problem of servicing the competitive calls is solved. The basic principle of proposed switchboard construction is the application of multilayered matrix. We performed extensive experiments and found that the optimal number of layers which is required to achieve good results is six layers. The results of using the proposed architecture is improving the efficiency of operation and reducing delay time.

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Contents

All Optical Networks (AONs) are widely regarded as the ultimate solution to the communication bandwidth needs of future generations of communication networks. Network bandwidth is growing significantly at approximately 40% per year mainly driven by mobile and cloud technologies. As a result there is an increasing requirement from optical transport networks for additional capacity, higher spectral efficiency and lower cost per bit. Prior studies have indicated that in 2017, 90% of the client services would be 10G or below, while the network line rate has reached 100G and beyond [1].