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Comparative Performance Analysis of Fiber Delay Line Based Buffer Architectures for Contention Resolution in Optical WDM Networks

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Abstract : Wavelength division multiplexing (WDM) technology is the most promising technology for the proper utilization of huge raw bandwidth provided by an optical fiber. One of the key problems in implementing the all-optical WDM network is the packet contention. This problem can be solved by several different techniques. In time domain approach the packet contention can be reduced by incorporating fiber delay lines (FDLs) as optical buffer in the switch architecture. Different types of buffering architectures are reported in literatures. In the present paper a comparative performance analysis of three most popular FDL architectures are presented in order to obtain the best contention resolution performance. The analysis is further extended to consider the effect of different fiber non-linearities on the network performance.

Keywords : WDM network, contention resolution, optical buffering, non-linearity, throughput
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