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Performance Evaluation of an Efficient Asynchronous Protocol for WDM Ring MANs

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Abstract : The idea of the asynchronous transmission in wavelength division multiplexing (WDM) ring MANs is studied in this paper. Especially, we present an efficient access technique to coordinate the collisions-free transmission of the variable sizes of IP traffic in WDM ring core networks. Each node is equipped with a tunable transmitter and a tunable receiver. In this way, all the wavelengths are exploited for both transmission and reception. In order to evaluate the performance measures of average throughput, queuing delay and packet dropping probability at the buffers, a simulation model that assumes symmetric access rights among the nodes is developed based on Poisson statistics. Extensive numerical results show that the proposed protocol achieves apart from high bandwidth exploitation for a wide range of offered load, fairness of queuing delay and dropping events among the different packets size categories.

Keywords : asynchronous transmission, collision avoidance, wavelength division multiplexing, WDM
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