

Fast ZeroY algorithm for efficient message routing in optical multistage interconnection networks

ABSTRACT

Limited by the properties of optical signals, it is not possible to route more than one message simultaneously, without optical crosstalk, over a switching element in an Optical Multistage Interconnection Networks (OMINs). One solution, called the time domain approach, avoids optical crosstalk by arranging the permutation in such a way that a set of crosstalk-free connections can be established and each connection set be made active in different time slots. Based on the Zero algorithms, we proposed a fast and efficient crosstalk-free algorithm for message routing in optical Omega multistage networks. The Bitwise Window Method (BWM) is used to identify potential message conflicts that may further lead to optical crosstalk. In addition, the inverse Conflict Matrix (iCM) is used to map identified conflicts between messages in the network. It is shown that the new algorithm successfully improved the execution time in comparison to the original Zero algorithm.

Keyword: Fast ZeroY algorithm; Crosstalk-free algorithm; Message routing; Time domain approach