

DETERMINISTIC ROUTING ON THE ARRAY WITH RECONFIGURABLE OPTICAL BUSES

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ABSTRACT

In this paper we present efficient deterministic algorithms for various classes of routing problems on the array with reconfigurable optical buses (AROB).

Keywords: Reconfigurable Networks, Packet Routing

1. Introduction

In any fixed connection network, a single step of interprocessor communication can be thought of as a packet routing task. The problem of routing can be stated as follows: There is a packet of information at each node that is destined for some other node. Send all the packets to their correct destinations as quickly as possible making sure that at most one packet crosses any edge at any time. Packet routing is equivalent to the random access write operation first defined by Nassimi and Sahni [6]. The *run time* of any packet routing algorithm is defined to be the time taken by the last packet to reach its destination. The *queue size* is the maximum number of packets that any processor will have to store during the algorithm.

The problem of *partial permutation routing* is the task of routing where at most one packet originates from any node and at most one packet is destined for any node. Any routing problem where at most h packets originate from any node and at most h packets are destined for any node will be called *$h-h$ routing* or *h -relations* [10]. In this paper we study routing problems on the AROB.

An AROB [8, 9] is essentially an $m \times n$ reconfigurable mesh in which the buses are implemented using optical technology. This model has attracted the attention

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