Title: HPAM–A Deadlock-Free Multicast Routing Algorithm for Irregular Networks
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Abstract.

Recently, networks of workstations (NOWs) with underling switch-based networks have been considered as a cost-effective alternative to massively parallel processors. This paper presents a new deadlock-free tree-based multicast algorithm, HPAM, for irregular networks. The HPAM algorithm selects a node represents the horizontal path ancestor (hpa) of all destinations in the multicast. The hpa is calculated first at the source node and attached to the packet during the transmission. HPAM consists of two phases, the first has a single-head worm and the second has a multi-head worm. The multicast message is first routed to the hpa and after the message has arrived at the hpa, the head of the worm will need to split into a multi-head worm. The heads of the multi-head worms may split repeatedly in order to reach all of the destinations. A mathematical model is introduced to define the message forwarding of the HPAM algorithm. Simulation studies on different irregular networks are introduced to demonstrate that the HPAM algorithm outperformed a previous algorithm.