경유교환기 수의 제약을 고려한 패킷 통신망 설계에 관한 연구

(Topological Design for Packet Network with Hop-count Constraints)

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ABSTRACT

Traditionally, the scarce and expensive resources in communication networks has been the bandwidth of transmission facilities; accordingly, the techniques used for networking and switching have been chosen so as to optimize the efficient use of that resource. One of them is the packet switching for data communications, which is much different from the circuit switching. It allows multiple users to share the data network facilities and bandwidth, rather than providing specific amounts of dedicated bandwidth to each users. One main challenge therefore has been to design and build cost-effective packet switching networks. In this paper, we develop a mathematical programming model and heuristic algorithm for designing the packet switching networks with hop-count constraints. To develop an efficient heuristic, we apply the Lagrangian relaxation method. Some valid inequalities, which have been known as the tight constraints, are considered to improve the bound for Lagrangian sub-problem. The computaional experiments show that the performance of the proposed heuristic is very satisfactory in both the speed and the quality of the design solutions generated.