

Wireless ATM Backbone Network Design Problem

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Abstract

Personal Communication Network (PCN) is an emerging wireless network that promises many new services for the telecommunication industry. The high speed backbone network (ATM or WDM) is one possible approach to provide broadband wireless transmission with PCN's using the ATM switching networks for interconnection of PCN cells. The wireless ATM backbone network design problem is that of allocating backbone links among ATM switches to reduce the effects of terminal mobility on the performance of ATM-based PCN's. In this paper, the wireless ATM backbone network design (WABND) problem is formulated and studied. The goal of the WABND is to minimize the location update cost under constraints. Since WABND is NP-hard, a heuristic algorithm and a genetic algorithm are proposed to solve it. These algorithms are used to find the close-to-optimal solution. Simulated results show that the proposed algorithms are able to achieve good performance.

Key words : Backbone network; Genetic algorithm; Heuristic algorithm; NP-hard; Wireless ATM