QoS-based Multicast Routing Optimization Algorithms for Wireless Networks*

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ABSTRACT

Most of the multimedia applications require strict QoS guarantee during the communication between a single source and multiple destinations. This gives rise to the need for an efficient QoS multicast routing strategy. Determination of such QoS-based optimal multicast routes basically leads to a multi-objective optimization problem, which is computationally intractable in polynomial time due to the uncertainty of resources in wireless networks. This paper describes a network model for researching the routing problem and proposes a new multicast tree selection algorithm based on genetic algorithms to simultaneously optimize multiple QoS parameters. The paper mainly presents a QoS Multicast Routing algorithms based on Genetic Algorithm (QMRGA). Simulation results demonstrate that the algorithm is capable of discovering a set of QoS-based optimal or near optimized, non-dominated multicast routes within a few iterations, even for the networks environment with uncertain parameters.

Keywords: QoS, multicast routing, wireless networks, genetic algorithm, uncertain parameters.

*The work is supported by Key Scientific Research Project of Hubei Education Department (2003A002), NSF of Wuhan University of Science and Engineering (20032418) and Priority Discipline of WUSE (2003P1008).