

An Improved Genetic Algorithm for Solving QoS Distributed Routing Problem

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ABSTRACT

The distributed routing problem in computer networks is also known as the Steiner tree problem which has been shown to be NP-complete. In this paper, we propose a new QoS distributed routing algorithm based on Genetic Algorithms. We have incorporated the neural networks into our genetic algorithm (GANN) to dynamically control the rate of mating and mutation rate. Our algorithm considers multiple QoS metrics, such as bandwidth, delay, delay jitter, and packet loss rate, to find the multicast tree that minimizes the total cost. The analysis of the algorithm presented, backed up by simulation results, confirms its superiority over the other algorithms. This algorithm is simple, efficient, and scalable to a large network sizes.

Keywords: genetic algorithm, delay constrained, distributed routing, QoS.