Ant Colony Algorithm and its Application in QoS Routing with Multiple Constraints

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Abstract In the modern communication network, QoS routing optimization problem acts as one of the most important types of discrete optimization problem which could normally be solved by heuristic algorithm. And Ant Colony Algorithm as a new heuristic optimization algorithm shows good performance in solving complex optimization problems. In this paper, Ant Colony Algorithm is presented to solve the QoS unicast routing problem under the constraints of bandwidth and delay, using the mechanism that ants are able to find the optimal path through pheromone and joining the heuristic strategy. The simulation results show that this algorithm can quickly find the routing that meets the constraints of time delay and bandwidth with minimum cost and minimum time delay.

Keywords Ant colony algorithm · QoS routing · Cost · Delay · Dijkstra algorithm

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