Abstract

Quality-of-Service (QoS) routing plays an important role in the provision of real-time services with guaranteed service quality such as bandwidth and end-to-end delay. Its task is to find the least cost path among the routes which support the requirement of every connection setup request. But the computational complexity is too high because this task is constrained optimization problem (NP-complete). For this reason, source routing in which the computation is committed by the source node only, is not a practical approach. So, distributed routing is reasonable solution.

We propose a new distributed QoS routing scheme named PSP (Pre-computation based Selective Probing) which is based on pre-computed information and selective probing. In this algorithm, we compute cost and QoS metrics respectively for least cost path best QoS paths. Using these expanded pre-computed information, we can limit the set of neighbor nodes for the following probing process more strictly. This helps to reduce message complexity, which is the most important overhead of distributed QoS routing schemes, without sacrificing cost optimality. First, we discuss the PSP scheme in the exact state-information case and then, expand it to the imprecise state-information case. Computer simulation reveals that the PSP scheme has low message complexity and high success ratio with guaranteed optimal search.

Keywords - QoS routing, pre-computed information, selective probing, imprecise state-information

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