

A Control Method of a P2P Network with Small Degree and Diameter

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In this paper, we propose a control method of a P2P network based on a DHT with its maximum degree 4 for routing and its diameter $\lceil \log_2 n \rceil$ where n is the number of nodes.

In previous methods, the maximum degree or the diameter is only probabilistically bounded. As the degree of a vertex is the number of the neighbor nodes, a node with a large degree suffers high load to transfer many queries. Even if the average degree is bounded, the loads of some nodes with large degrees are exponentially high. As the diameter of a network is the worst distance, a large diameter causes bad response time. Even if the average diameter is bounded, the performance between two nodes apart from each other is always bad. Therefore, it is important that the degrees and the diameter are always small. We show that the proposed method has this good property.