

D1HT: A Distributed One Hop Hash Table

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Distributed Hash Tables (DHTs) have been used in a variety of applications, but most DHTs so far have opted to solve lookups with multiple hops, which sacrifices performance in order to keep little routing information and minimize maintenance traffic. In this paper, we introduce D1HT, a novel single hop DHT that is able to maximize performance with reasonable maintenance traffic overhead even for huge and dynamic peer-to-peer (P2P) systems. We formally define the algorithm we propose to detect and notify any membership change in the system, prove its correctness and performance properties, and present a Quarantine-like mechanism to reduce the overhead caused by volatile peers. Our analyses show that D1HT has reasonable maintenance bandwidth requirements even for very large systems, while presenting at least twice less bandwidth overhead than previous single hop DHT.