AN ENHANCED TECHNIQUE BASED ON CHORD ALGORITHM

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Abstract

Peer to peer systems contain connected nodes that send messages to each other. One of the most used distributed algorithms to manage messages passing between nodes is the Chord algorithm. Chord algorithm depends on hashing technique and works by forwarding query messages between connected nodes. However, Chord algorithm is inefficient in some cases because of the way it handles queries transferred between connected nodes in the network. All the queries in Chord are passed clockwise along a virtual ring called the Chord ring. Therefore, the search process and data retrieval will take relatively amount of time to reach the destination, where each node forwards its query through the ring until it reaches the node holding the required data. This slows down the data retrieval as a result of the high number of visited nodes. This thesis introduces a new technique for accelerating the query between nodes. The new technique, called Chord MCF, is a modified Chord DHT algorithm. Chord MCF adopts a lookup table, called Managed Centralized File (MCF), over the Chord DHT algorithm. The new implemented table stores data about the previously visited nodes in the Chord ring to use this data later when nodes required to be visited again. MongoDB is used to implement the MCF. Chord MCF is implemented over the Chord DHT using a simulator prototype. For evaluating the performance of the new technique, it was compared to the Chord DHT in terms of the total number of messages sent by the nodes and the total time required to retrieve data.

Comparison included fixed and dynamic Chord rings. Additionally, the performance of two databases, MongoDB and MySQL, was evaluated in Chord MCF regarding the time required to retrieve data among nodes. Well-prepared datasets were used in the experiments. Results demonstrated that the proposed technique reduces the number of messages and the time required by 60% to retrieve data compared to the Chord DHT. Results also showed that MongoDB outperformed MySQL regarding the time required to retrieve the data.